PEER-MEDIATED SOCIAL SKILLS INTERVENTION OF ELEMENTARY STUDENTS WITH HIGH-FUNCTIONING AUTISM

by
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Abstract

Successful generalization of learned social skills in elementary students with Autism Spectrum Disorder (ASD) can be promoted through rehearsal and practice with typically developing peers in natural settings. However, current social skills training for students with high-functioning ASD in inclusive public school settings is typically mandated by the student's Individual Education Plan (IEP), and often entails little more than a half hour per week of instruction by a specialist working with two to three students who share similar social communication deficits. This type of intervention is referred to as the pull-out model since the child is removed from the classroom curriculum for a specific amount of time. Without the chance to transfer learning into authentic situations (e.g. recess, lunch) with typically developing students, the training process is incomplete, and the opportunity for generalization can be lost. This study examines possible explanations for continued use of this model, explores the perceptions of stakeholders regarding the need for a new service delivery, and reviews literature to explore optional models that might provide comprehensive social skills training. Subsequently, a model incorporating generalization opportunities in natural settings with typically developing peers is selected as a viable option. This new model, peer-mediated social skills instruction (PMII), is utilized in a recess intervention in two elementary schools in a district that currently employs only the pull-out model. Results are discussed concerning implications for future use of PMII as a supplement to the current social skills model.

Keywords: autism spectrum disorder, social skills training, social skills generalization, inclusive education, peer-mediated social skills intervention.

Dissertation Adviser: Dr. Patricia Hershfeldt

Dedication

This work is dedicated to my husband, Peter, whose belief in me and encouragement years ago eventually sent me off on this journey. It is also dedicated to my dear daughter, Molly, who has ever ceaselessly cheered me on in my endeavors but never more so than during the last three years.

"*Live as if you were to die tomorrow. Learn as if you were to live forever.*"

- Wallace, *Life of St. Edmund of Canterbury, 1893*

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Chapter 1: Executive Summary

The mission statements of most large, urban school districts include goals to meet the educational needs of all students through provision of quality education that prepares them to become productive members of the community. This occurs by meeting not only their intellectual, emotional, and physical needs, but also social competence needs. Students with Autism Spectrum Disorder (ASD) who are high functioning require a comprehensive social skills program in order to acquire that social competency. Unlike their typically developing peers, these students need to "learn" social skills through specifically designed instruction, followed by opportunities for generalization and maintenance in natural settings across time (Koegel, Kuriakose, Singh, & Koegel, 2012). Such districts' current social skills training models provide instruction and opportunities for practicing social skills, but omit opportunities for generalization and maintenance.

Social competence is a multidimensional concept consisting of social, emotional (e.g., affect regulation), cognitive (e.g., skills for processing/acquisition, perspective taking), and behavioral (e.g., conversation skills, pro-social behavior) skills needed for successful social adaptation (Semrud-Clikeman, 2007). Students with ASD are often challenged by inherent deficits in deciphering the social environment, and may already lack many skills necessary for social competence when they arrive in elementary school (Ingersoll, Schreibman, & Stahmer, 2001). These social challenges can accrue exponentially over time. Students with high-functioning ASD (HFA) are typically placed in inclusive settings as their cognitive abilities allow them to navigate the general education academic requirements. The inclusive placement is also often considered an opportunity for those students to interact with typically developing peers (Chamberlain,

Kasari, & Rotheram-Fuller, 2007). However, students with HFA placed in such settings may still exhibit socially inappropriate behaviors that potentially ostracize them from others (Ingram, Mayes, Troxell, & Calhoun, 2007).

Currently, many district models of social skills training occur in a situation in which the student with HFA is pulled out of the general education classroom for little more than a half hour per week of instruction by a specialist working with two to three students who share similar social communication deficits. This model does not necessarily transfer to real-life situations for these students' due to their inability to differentiate between contexts (Klin, Jones, Schultz, & Volkmar, 2003). Thus, in spite of the time and financial outlay the districts provide for the current social skills training model, these students often become more socially isolated in natural settings (Chamberlain et al., 2007).

The Problem of Practice

Most people are able to quickly process social cues and interpret people's intentions; however, the social skills deficits that impact many individuals with autism can impair those abilities (Bauminger, Shulman, & Agam, 2003). Students with HFA tend to rely on one method taught to apply in one situation, and assume it is to be used exclusively, even in different contexts (Williams White, Keonig, & Scahill, (2007). Due to an inability to focus on social stimuli, even those students with HFA are less able to imitate and re-enact social behaviors, and so require opportunities to generalize what they have practiced in order to transfer learned social skills into real-life situations (Klin et al., 2003). Social skills training service delivery models, such as the one utilized in most districts, do not include generalization and maintenance of the learned social skills.

Without the chance to transfer and generalize learning with typically developing peers into real-life situations (e.g., lunch and recess), the training process is incomplete (Klin et al., 2003). Research findings suggest that, in the absence of multiple opportunities with peers, students with HFA do not generalize those skills they have learned in isolation with an adult to new contexts (Scheeren, Koot, & Begeer, 2012). Long-term effects of lack of social competency may only accrue throughout life and negatively impact a student with HFA, as well as the student's family and community.

Community ramifications of this problem of practice. Evidence that this problem of practice is a relevant one has been noted throughout literature that discusses effects on the community when social competence in this population is not addressed. Longitudinal studies of students diagnosed with HFA have indicated that in the long-term they can continue to have at least some dependence on family and separation from their community, due to social skills deficits (Cederlund, Billstedt, Gillberg, & Hagberg, 2008; Howlin et al., 2004). Parents of 26% of this group also reported that their adult children led restricted social lives with few friends, and experienced even fewer romantic partners (Cederlund et al., 2004). These circumstances exist in spite of the self-reports by many adolescents with HFA that they have the desire to be social but are usually confused about how to acquire social skills and/or when and where to use them (Muller, Schuler, & Yates, 2008; Bauminger et al., 2003). Studies have found it to be common for adolescents and young adults with autism to exhibit symptoms of depression and anxiety, and this population typically reports higher rates of loneliness than do those without autism (Shtayermman, 2009).

An estimated 50-75% of adults with high-functioning autism are unemployed as adults (Hendricks, 2010). Prevalent difficulties reported by this population in procuring and keeping a job included ineffective social interaction in the original hiring interview, adjusting to new routines and job settings, and social difficulties with supervisors and coworkers, all due to inability to "read between the lines" (Howlin, Goode, Hutton, & Rutter, 2004). Thus, the community suffers, as well, in the loss of social and human capital.

The Current Social Skills Training Model

Following assessment, high-functioning learners in a district who meet eligibility criteria to receive special education as a student with ASD are usually provided specifically designed-instruction in social skills on an Individual Education Plan (IEP). A comprehensive social skills program, according to evidence-based research, should include four essential steps: instruction, practice, maintenance of skills, and generalization (Koegel et al., 2012).

Students with HFA typically receive a minimum of 120 minutes of social skills training per month, provided by a certified specialist (Ferny-Harris, Prater, Dyches, & Allen-Heath, 2009). This type of intervention is a common model utilized across the United States to meet goals on an IEP, and is referred to as "pull-out" since the child is removed from the classroom curriculum for a specific amount of time (Vicker, 2009). Sessions are typically held weekly with two to three students who are all working in isolation on the same IEP social goals (Ferny-Harris et al., 2009; Vicker, 2009). As they learn skills, students can practice and role-play with each other in the small-group setting through staff facilitation utilizing this model (Vicker, 2009).

There are several drawbacks to this current service delivery model. The presenter is, by design, an adult provider and the students in the session all share the same communication deficits, so there is no modeling of social skills by typically developing peers within the setting (Ferny-Harris et al., 2009). Thus, students may not generalize skill usage to the classroom, home, and community (Vicker, 2009). Many may even believe that the new skills should only be used in the therapy room, so then resist efforts by staff to coax them to use newly learned behaviors in other contexts (Vicker, 2009). Although the time allocated for this model meets minimum requirement for the IEP, it does not progress beyond the first one or two steps of training considered necessary for best practice (Williams-White et al., 2007).

Why the Current Delivery Model Prevails

Without generalization, the student with ASD often becomes more socially isolated in natural settings; yet, this incomplete model continues to prevail in many districts. A review of the literature reveals possible drivers of economic, cultural, and social forces in public schools that contribute to the lack of implementation of a model that includes all necessary steps.

Recent budgetary restrictions have resulted in fewer specialists being hired in many districts nationwide (Goldberg, 2013). Due to high caseloads and assignments to several schools, as is the case nationally (Ferney-Harris et al., 2009), specialists are no longer available to consistently provide generalization opportunities for inclusion students with autism (Idol, 2006).

Traditional assumptions about separation between general and special education roles, and whose responsibility it is to promote generalization, is another area that

contributes to the lack of generalization of social skills in an inclusive setting (Winn & Blanton, 2005). Although general education teachers attend IEP meetings and are aware of the social skills goals of their respective students with HFA, the provider indicated on the plan is special education staff. There can be confusion about how that provision overlaps into the general education classroom unless administration supports collaboration of special and education staff (Idol, 2006).

Paraprofessionals have often been responsible for providing skills generalization supports to students with disabilities in inclusive settings. That practice has changed over the last few years, however, due to budgetary cuts and the growing concern that adult assistance can often hamper social interactions and promote student dependence, since a typical peer is often absent in this scenario (Carter, O'Rourke, Sisco, & Pelsue, 2009).

Thus, a review of the literature indicates that the above attempted models have not met the evaluation criteria that best fit a public school setting: efficacy within time constraints, cost, administrative feasibility, and sustainability (McFadden, 2013). The outcomes of these alternative models, then, are no longer considered successful according to many administrative stakeholders. Just as significantly, the current model is not necessarily considered successful by other stakeholders in the district, such as staff and parents of students with HFA, as was indicated in a needs assessment.

Stakeholders' Perceptions of Adequacy of the Current Delivery Model

A needs assessment was conducted to survey stakeholders' perceptions of the current service delivery model of social skills training for high-functioning students on the autism spectrum in inclusive settings within a suburban district in the northwest.

Thirty parents and thirty staff members participated in the survey and were asked to rate how well the current service delivery model of social skills training at school has met the needs of their students. The categories between most inadequate to somewhat inadequate were endorsed by the majority of the parents and staff when describing their perceptions of the current model of social skills delivery.

The most highly identified perceived causes for inadequacy in both groups of respondents were lack of practice of learned skills with general education peers in the classroom, limited training time with the specialists, and concern about the lack of time to practice and generalize skills in natural settings. When asked how seriously they would rate the risk of negative consequences for their students' social competence development if no changes were made to the current model, 100% of the parents and 88.8% of the staff rated it "serious to very serious." Thus, stakeholder dissatisfaction with the current delivery model of pulling out students with HFA from their general education classrooms once a week for isolated social skills training suggests a need for exploration of a more comprehensive service model.

Social Skills Models Supporting Evidence-Based Practices

A literature review to explore more evidence-based options for social skills training models revealed that generalization of social skills in natural settings via peer-mediated interventions monitored by staff have been very successful (Kasari, Rotheram-Fuller, Locke, & Gulsrud, 2012). The success of this model was attributed to not only the natural appeal to children of learning through their peers, but also because it addresses the lack of classroom time available to teachers to devote to specific social skills

instruction due to the focus on academic performance (Owen-DeSchryver, Carr, Cale, & Blakeley-Smith, 2008).

The literature identified three aspects related to success for this population. First, the use of evidence-based approaches including the four steps of social skills training (teaching skills, rehearsing them in a small setting, generalization in natural settings with typical peers, and staff monitoring for skills maintenance over time) made the most enduring impact on students' skills (DiSalvo & Oswald, 2002; Kasari et al., 2012; Koegel et al., 2012). Second, in addition to citing the importance of students to be social within naturalistic school climates, the literature also emphasized that at least three peer trainers per student with HFA increased opportunities for social interaction modeling. The number of training sessions for peer trainers was also indicated to be an important element for success (Owen-DeSchryver et al., 2008).

Benefits of utilizing peers to train students with autism. Research has shown that there are multiple benefits of using peer trainers in the set-up of social skills training in natural settings. Specifically trained, typically developing peers are much more likely to model age-appropriate social skills naturally than staff, and peer trainers have been found to foster greater independence in their trainees than do adults working with students on the autism spectrum (Koegel et al., 2012).

Rotation among multiple peer trainers has also been indicated in the literature as a component for successful social skills training in that it promotes maintenance and generalization (DiSalvo & Oswald, 2002; Harper, Symon, & Frea, 2008). Using more than one peer to support a classmate may provide exposure to a wider range of skill and

motivation levels for the student with autism (Carter, Cushing, Clark, and Kennedy, 2005).

Benefits for peer trainers. In addition to the benefits of this model of social skills training for the students with ASD, the peer trainers can also glean much from this experience. Carefully selected and trained typically developing peers also benefit from an increase in empathy, understanding, and tolerance for differences as they work with peers on the autism spectrum (Williams-White et al., 2007).

Peer-Mediated Social Skills Intervention

In order to examine whether peer-mediated social skills instruction can successfully provide opportunities for generalization and maintenance of those skills that students with HFA learn in their pullout social skills sessions, an intervention at recess utilizing single-case design was implemented from January until mid-April, 2017, in two elementary schools within a suburban district in the northwest. The peer-mediated social skills training of four target students within two elementary schools examined whether intensive peer-facilitation of social skills resulted in increased social interaction in the high-functioning students with ASD. The following research questions drove the method and design of the study:

RQ1: What is the effect of social skills mediation by trained peers on the *frequency* of social interactions of elementary students with HFA?

RQ2: What is the effect of social skills mediation by trained peers on the *quality* of social interactions of elementary students with HFA?

RQ3: How does compatibility between the target student and peer trainer further vary the frequency of social interactions of students with HFA?

RQ4: How does the training and experience in the study affect the quality of empathy in the peer trainers?

Participants in the study included four fourth-grade target students with HFA from inclusive settings, and 12 fourth-grade peer trainers who attended six hours of peer-implementation training. The student investigator trained the typically developing peer buddies in mediation and facilitation of social skills, and then assigned three of those peer buddies to each of four high-functioning students with ASD according to their compatibility of interests. The compatibility match was derived from the results of the student interest surveys completed by both the target students and the peer trainers prior to the study.

A three-week baseline phase with no peer trainer involvement was followed by ten weeks of twenty sessions of intervention during which the peer trainers mediated and facilitated social interactions with the target students. The multiple baseline design graphs indicated very few social interactions (i.e., eye contact, social initiation, and/or verbal response) observed in any of the four target students during the baseline weeks. However, the graphs indicated an immediate increase in all areas of social interaction after the peer trainers joined the target students in the intervention phase, and these same behaviors continued for the entire ten weeks in varying degrees across the four target students.

Two-weeks of generalization probes were conducted a month later without peer trainers present in a different setting (lunch) with positive results of continued social interaction in three of the four target students. Pre-, mid-, and post-intervention social skills checklists completed by recess-duty teachers indicated a significant increase in the target students' overall observed social interaction by the end of the intervention. The

parents of the four target students also completed the identical checklist on the same schedule of pre-, mid-, and post-intervention intervention, and indicated a slight, but insignificant, increase in observed social behaviors at home during the time of the intervention.

Peer trainers completed checklists before and after the intervention to measure any increase in their level of empathy as a result of the training and their personal experiences in the study. Nonparametric statistical analysis of the pre- and post-surveys indicated a significant positive growth in empathy level. Peer trainers also completed follow-up surveys about their participation in the study, which provided social validity through positive consumer evaluation of satisfaction with the experience of being a peer trainer.

Conclusion

According to the literature review, a continuous yearly service delivery model of social skills training that incorporates the use of evidence-based strategies, multiple peer trainers, and a minimum of bi-weekly peer buddy sessions in the school setting would be optimal (Harper et al., 2008; Kasari et al., 2012). Results of a similar peer-facilitated social skills intervention that was recently implemented by the student investigator in elementary schools in a large suburban school district indicated that a measurable increase in social interaction of students with HFA was observed only when the peer trainers intervened. Overall, a functional relationship was observed between the social facilitation of the peer trainers and the increase in the target students' social responses, eye contact, initiations, and overall social engagement. Results of a social validity

checklist by school staff indicated a significant increase in social skills over the timeline of the study.

Based on the literature review, as well as the results of the recent intervention in one suburban district in the northwest, success of a four-step comprehensive social skills training program in the elementary setting could be quite possible, and is recommended.

Chapter 2: Review of Empirical and Theoretical Literature

Social competence, a goal stated in the mission statements of most public educational institutions, is the foundation upon which future interactions and relationships are built, and the roots upon which students develop awareness and perceptions of their own behavior (Gutstein & Whitney, 2002). Being socially competent implies possession of social, emotional, and cognitive skills needed for successful social adaptation (Hemmeter, Ostrosky, & Fox, 2006). Social skills enhance interpersonal success at school, at work, and within the community (Stichter, O'Connor, Herzog, Lierheimer, & McGhee, 2012).

Schools are an important context for early social development of students (Ringeisen, Henderson, & Hoagwood, 2003). In order to be socially successful in the school setting, children require the ability to regulate negative emotions, stay focused, read social cues, follow directions, and navigate relationships (Stichter et al., 2012). Due to an inherent inability to focus on social stimuli, however, students with ASD may already lack many skills necessary for social competence when they arrive in a general education setting (Ringeisen et al., 2003). Thus, those students are less able to imitate social behaviors without comprehensive social skills training that include generalization in order to transfer and practice the learned social skills in natural settings (Klin et al., 2003). Without such a foundation, social deficits in students with ASD can accrue exponentially over time (Ringeisen et al., 2003).

Contextual Background

Unlike their neurotypical peers, even individuals with high-functioning ASD need to learn the social skills through specifically designed social skills instruction, followed

by generalization in natural settings across time (Bellini et al., 2007; Koegel et al., 2012). Although the process takes time and effort, provision of opportunities for social skills training, generalization, and maintenance can result in a positive lifetime impact on the individual's social and human capital, which, in turn, can benefit society (Bourdieu, 1986).

The *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition,* (DSM-V) defines Autism Spectrum Disorder (ASD) as a neurodevelopmental disorder characterized by social communication impairments in: (a) greeting and communicating socially with others, according to the social context; (b) adapting communication to match the situation or the listener, such as speaking differently in a school than on the playground, talking differently to a child than to an adult, or avoiding overly formal language for the context; (c) following conversation rules, such as taking turns and reciprocal exchanges in conversing, rephrasing when not understood, and reading social cues and body language of others, as well as knowing when and how to use verbal and nonverbal signals to regulate interaction; and (d) making inferences, understanding what is not explicitly stated, as well as nonliteral meanings of language such as idioms, humor, and metaphors (American Psychiatric Association, 2013). Those with ASD may also demonstrate restricted, repetitive patterns of behavior, interest, or activity; rigidity and dependence upon routines; high sensitivity to environmental changes; and/or intense and unusual focus on certain items (American Psychiatric Association, 2013). Under the DSM-V criteria, individuals with ASD must demonstrate a history of symptoms from early childhood, even if those symptoms are not recognized until later (American Psychiatric Association, 2013).

Theoretical Framework

According to Bandura's (1989) social cognitive theory, learners explore social interaction, interpret the actions of others, and adapt their own actions based on others' reactions. This ability to focus attention to social stimuli and imitate social behaviors of others is often impacted in those with ASD (Klin et al., 2003). Thus, traditional social skills training in which students artificially practice new skills through imitation in small groups does not necessarily transfer to real-life situations for these students (Klin et al., 2003). In a school context, an extremely social environment, social cognition allows one to understand teacher and student expectations. How do learners *know* these skills and make the appropriate decisions?

During social development, through experience watching others, as well as by trial and error rehearsal, those skills are learned and become second nature (Buron & Curtis, 2012). The *theory of mind*, a well-researched concept, accounts for challenges that confront those with autism in acquiring these skills. This concept was first introduced by Baron-Cohen, Leslie, and Frith (1985) as the ability to attribute mental states to one's self and to others while understanding that one's thoughts are different from others. It would follow, then, that an intact theory of mind would enable one to predict the actions and intentions of others (Hamilton, 2009). Similarly, empathy could be considered a reflection of a learner's ability to understand another's mental state (Baird, Scheffer, & Wilson, 2011). Deficits in the theory of mind often result in an inability to infer that another individual has separate needs and wants, which could explain the difficulty students with ASD often demonstrate in sharing with others (Korkmaz, 2011).

Although the social patterns of individuals with ASD do not evenly align with social cognitive theory, the concept of *social motivation* has recently gained increased interest in explaining language and social skills acquisition (Syal & Finlay, 2011). Social motivation drives the need for acceptance and avoidance of peer rejection, while increasing attention to social cues (Syal & Finlay, 2011). According to Chevallier, Kohls, Troiani, Brodkin, and Schultz (2012), autism can be considered as a state of diminished social motivation that results in reduced social cognition and development. This paradigm further suggests that reduced social motivation in childhood can deprive a child of crucial social input during the development of social cognition (Chevallier et al., 2012, p. 236). Social motivation, however, can be manifested differently according to the degree of impairment and symptomatology demonstrated by the student with ASD.

The Problem of Practice

Research suggests that in order for students with high-functioning ASD (HFA) to generalize newly learned social strategies, subsequent rehearsal and practice of the new skills with typically developing peers in natural settings is required (Bellini et al., 2007; Koegel et al., 2012). However, the most prevalent social skills training model currently utilized for elementary students with HFA in public schools entails pulling them from general education to another setting (Bellini et al., 2007; Sunderland, 2004). There they receive less than forty minutes per week of instruction by a specialist working with two to three students who share similar social communication deficits (Bellini et al., 2007; Sunderland, 2004). Although this service complies minimally with the weekly social skills training on the student's Individual Education Plan (IEP), learning new skills in isolation with a few students and an adult provider does not include modeling of these

social skills by typically developing peers. Without the chance to transfer learning into real-life situations (e.g., recess) within the current service delivery, the opportunity for generalization is lost (Koegel. et al., 2012). Thus, in spite of the financial and personnel resources that districts expend to provide social skills training through adult-led small groups, the current model of training is incomplete and does not fully serve the needs of students with HFA (Bellini et al., 2007; Koegel et al., 2012).

Although there have been clinical interventions and research studies demonstrating the need for maintenance and generalization phases within a social skills program, very few schools have *followed through with including these last two stages of* social skills in a model (McFadden, Kamps, & Heitzman-Powell, 2014; Rogers, 2000; Williams-White et al., 2007). After taking the first step of investing staff time and district money to provide social skills lessons to general education students with HFA, it would seem reasonable that the last two steps to complete the training would also be implemented. Following this line of logic, then, perhaps this provision of opportunities for generalization occurs through general and special education teachers, other specialists, paraprofessionals, or even parents. This literature review will examine the following three possibilities of how maintenance and generalization steps of social skills training might be provided: (1) parents fill this training gap by utilizing outside private services; (2) school staff members, other than the current social skills training provider in each school, supplement social skills training for these students; and/or (3) the current model in which students are pulled out of the general education classroom is the only social skills training provided to the students. If the third option is the sole skills training

delivery model, then the obstacles that hinder such service in public school districts will be explored.

The Economic Impact of Autism on the Individual and Family

Many parents take responsibility for bridging the gap in the school social skills training by providing private therapy for their students that may or may not be partially covered by insurance. Fletcher, Markoulakis, and Bryden (2012) set about to research costs to parents of caring for a child with autism, specifically addressing areas in which the greatest outlays fall. Eight semi-structured interviews were completed highlighting costs associated with the care of a child diagnosed with autism. Emerging themes within the data included high costs of special diets, childcare, private lessons, and cleaning and repairing homes. One of the highest costs was private social skills therapy that was not covered by all insurance policies. One of the important self-reported limitations of the study was that the participants were all married female primary caregivers of children with ASD, excluding the views of single female caregivers. The study concluded that the financial outlay beyond insurance coverage for these impacted families could be prohibitive.

Lavelle, Weinstein, Newhouse, Munir, Kuhlthau, and Prosser (2014) conducted a comprehensive study of the overall economic impact of autism. The authors identified different categories of expenses for care of individuals with autism by analyzing annual utilization costs for health care, family wrap-around services, ASD-related therapies, school services, and time expended by the caregivers. The 258 parent surveys suggested over 30 percent of the children with ASD accessed at least one form of therapy annually.

These findings revealed that there exist large financial costs of autism to the public, yet a large proportion of families with children with ASD have to absorb these costs. The reported financial impact on individual families eliminates the possibility that this is a viable option to complete social skills training for all families of students with HFA in public schools. The findings further suggest the need for a socials skills training methodology that does not require compensation by parents with or without insurance.

Obstacles to Providing a Complete Social Skills Training Model in the Schools

Blurred boundaries between general and special educator roles. A relevant issue of social skills provision within public schools is the availability of classroom teachers to generalize skills training. Blurred boundaries often exist between the roles that special and general educators are required to take in educating students on IEPs (Winn, 2005). Both groups often ask whether it is the special education teacher's role to follow the socials skills learner to general education settings to ensure provision of social skills generalization, or if it is the responsibility of the general education teacher to take on that responsibility. It has been recommended that utilizing a team-teaching model of general and special educators would be beneficial to cover social skills training across settings (Friend, Cook, Hurley-Chamberlain, & Shamberger, 2010). In a discussion of the obstacles that continue to thwart successful implementation of the model of general and special educators co-teaching together, Friend et al., (2010) suggested that a possible source of resistance in general education teachers is their lack of full commitment to the belief that students with disabilities are deserving members of learning communities who happen to require more support than others. Both types of educators, who have traditionally been assigned their own classrooms, also require more exposure to the idea

that partnering in classrooms and sharing teaching, as well as physical space, can be mutually beneficial to all (Friend et al., 2010). These issues suggest that additional funding of professional development might be required if a district adopted this evidence-based strategy, although it is not currently the norm in public schools.

Ploessl and Rock (2014) studied general education and special education collaboration in a large urban district using eCoaching, a program in which teacher pairs coached each other online. The authors of the study recruited certified general and special education teachers to form three co-teaching dyads. The researchers' findings indicated a significant increase in participants' knowledge of strategies within co-teaching approaches for application with both general and special education students (Ploessl & Rock, 2014). Although the co-teaching results were encouraging, the sample size was small in this pilot study and the program was discontinued due to funding reallocation. In spite of this limitation, the positive results suggest a need for additional research.

Idol (2006) collected both quantitative and qualitative data through interviews with 125 public general and special education teachers in an urban school district about their perceptions of the best setting in which to serve special needs students of at least average cognitive ability. Eighty percent of the respondents endorsed a general education setting as best to serve this student population. Forty percent also indicated by their responses that this student group should be educated in general education classes with a special education teacher in the classroom providing support. Idol (2006) noted that although these options were desirable, they were not financially feasible for most districts.

Time limitations of specialists. Traditionally, speech/language pathologists and/or school psychologists have provided social skills training in isolation (Sunderland, 2004); yet, a common theme pervading the literature on social skills training is the lack of specialist availability because of an increasing number of schools assigned to each professional due to time constraints (Goldberg, 2013). One of the methods used to address ongoing decreases in federal funding for special education has been reduction in hiring of education specialists and school psychologists; however, the result has been a substantial increase in caseload for those employed specialists, subsequently hindering their ability to provide services outside of basic instruction (Goldberg, 2013).

Proctor and Steadman (2003) explored these issues by distributing a questionnaire to 63 school psychologists. Use of a multivariate analysis of variance determined response differences between those assigned to two schools or more and those assigned to just one school. Using job satisfaction, burnout, and perceived effectiveness as dependent variables, the researchers found that practitioners assigned to two or more schools were significantly more likely to report stress due to perceived lack of service time and efficacy in their roles than those serving only one school. The researchers concluded that such an increase in workload led not only to dissatisfaction, but also to a reduction in time available for social skills service delivery (Proctor & Steadman, 2003). Limitations of this study included a relatively small sample size, minimal geographic representation, and a questionnaire that was not standardized.

Ferney-Harris et al. (2009) explored job stress and time commitments of school-based speech-language pathologists. In their study utilizing the *Speech/Language Pathologist Stress Inventory* (SLPSI), 97 public school Speech/Language Pathologists

(SLPs) were asked to report on some of the major factors hindering the efficacy of the social skills service delivery. Large caseloads and time limitations were identified as two of the most difficult challenges. The results revealed an average caseload of 56.3 children per one full-time provider (Ferney-Harris et al., 2009). A limitation of this study was that only currently practicing SLPs were surveyed, rather than including those who had left due to burnout, which may have biased results.

Both of these studies reported that specialists identified large caseloads as a major factor in reducing what the surveyed specialists considered to be efficacy in their service delivery. Reports of such large workloads suggest little time to support students with generalization of social skills.

Utilization of paraprofessionals. Many school districts have limited the use of paraprofessionals due to budgetary constraints, as well as concerns that a student might develop dependence on that adult since a typical peer is often absent in this scenario (Giangreco & Broer, 2005; Giangreco, Suter, & Doyle, 2010). Paraprofessionals continue to be utilized to address the lack of availability of certified staff in financially struggling districts; however, researchers continue to document paraprofessionals without adequate professional mentoring being entrusted with high levels of autonomy and decision-making about instruction in situations that require they provide one-to-one supports with students with disabilities (Giangreco et al., 2010).

Carter, O'Rourke, Sisco, and Pelsue (2009) surveyed 313 paraprofessionals about their expertise who reported limited training and supervision, as well as little exposure to evidence-based practices. About one-third of the paraprofessionals who were surveyed reported they felt they needed much more training in order to best serve the disabled

population, including those with autism. A limitation reported by the authors was variance on the results of the knowledge questions that could have been due to the wide range of years of experience among the respondents, as well as due to self-reports. The overall results, however, provide some relevant data for autism researchers to investigate in considering whether paraprofessionals are the best candidates in public schools to deliver social skills training with fidelity.

This examination of literature reveals little evidence that the gap in social skills training can be met at home by all parents or in public schools that are financially struggling. First of all, the review revealed outside therapies for students with HFA are typically expensive and so not accessible to all parents (Lavelle, 2014). Secondly, budget constraints in the schools rule out utilizing specialists in the role of providing complete social skills training including typically developing peers as models. In addition, embedding social skills through shared responsibilities between general and special education co-teachers throughout the day in the inclusive classroom is slowly being introduced throughout districts, but has not been universally accepted due to high staff training and implementation costs to districts (Friend et al., 2010; Idol, 2006).

Another possible source of additional practice and rehearsal of new social skills has historically been through utilization of paraprofessionals; however, literature suggests that their role has been questioned due to concerns about students' over-dependence on adults, lack of the exposure students with HFA would have with typically developing peers in this model, and the lack of evidence-based training for the paraprofessionals (Giangreco et al., 2010).

In summary, literature findings suggested that reasons for the lack of generalization of learned social skills in schools range from budgetary and staff limitations in the school setting to the unreasonable financial outlay that would be required by parents to provide private services for their children with autism.

Realizing Human Capital and Making a Cultural Impact

Lack of opportunities as a child to generalize social skills across settings with typically developing peers may negatively impact development of social competence as an adult (Bauminger et al., 2003; Shtayermman, 2009). Consequences for students who have not been exposed to comprehensive social skills training can include obstacles to vocational and interpersonal success later in life (Farley et al., 2009: Hendricks, 2010).

Integration into the community for those with social skills deficits. Farley et al., (2009) conducted a follow-up study on 41 adults with a mean age of 32.5 years who had been diagnosed with high functioning ASD at an average age of 7.2 years old. The researchers interviewed the participants' parents about their adult children's current relationships and living arrangements. Parents of 44% of the adults reported that their children had not been in any romantic relationships, and only seven percent of the parents reported children were in long-term relationships. Only 12% of the adults were reported to live independently, and 46% reportedly required a high level of assistance, which included living with relatives and having little to no control of personal expenses. Only 54% of the adult children were reported to be working in independent, paid jobs (27% in full-time and 27% in part-time). A major limitation noted by the researchers was that most of the families in this study lived in a rural community with a religious influence

that provided much support. Thus, the concern was that the experiences of the sample were less representative of those shared by most adults with high-functioning autism.

Cederlund et al. (2008) studied long-term outlook for students with ASD, exploring whether those with a high level of functioning demonstrated relatively better long-term outcomes than students with autism who were lower functioning. The participants in the study included 70 males who had been diagnosed with HFA five years prior to the study and 70 males who had been diagnosed with autism who were found to have below average cognitive functioning five years before the study. Cognitive evaluations, language assessments, and adaptive behavior checklists indicated that 27% of the group with HFA were in the low average to average range in social communication and functional life skills. Parents of 26% of this group also reported that their adult children led a restricted social life with few friends, due to social deficits.

Implications for vocational success for individuals with autism. Although many adults with high-functioning autism successfully graduate from high school or even continue on to college, social skills deficits can contribute to difficulties in being hired and retaining employment. The literature provides evidence suggesting that successful employment outcomes among adults with high-functioning autism range from 10%–50% (Hendricks, 2010; Shattuck et al., 2012). These findings suggest that many adults with autism fail to enjoy the benefits that work can provide such as structure, self-esteem, and quality of life. In addition, society loses the productivity of these potential workers.

Shattuck et al. (2012) examined rates of college attendance and employment in adults with ASD by studying a large national sample of students, ages 19-23, who had held federal special education disability eligibilities while in school and had participated

in the National Longitudinal Transition Study 2. Surveys were sent to the 680 individuals in the sample, as well as to their guardians. The researchers found that those with ASD had a lower rate of employment relative to those in the other eligibility categories. The researchers also found that individuals with ASD had the highest risk of being completely removed from any kind of postsecondary education or employment.

As Hendricks (2010) reviewed evidence-based research on employment challenges of adults with autism, similar themes emerged. At the time of his study, he found an estimated 50–75% of adults with autism were unemployed. The difficulties he noted as prevalent included underemployment, the need to switch jobs frequently, and difficulty with adjusting to new routines and job settings. Lack of appropriate social interactions in the original hiring interview, social difficulties with supervisors and coworkers, and the inability to read social cues, were pervasive obstacles to employee retention reported by supervisors (Hendricks, 2010).

Hurlbutt and Chalmers (2004) interviewed six individuals with high-functioning autism to collect data on those areas of employment they found most challenging. The participants expressed pride in their abilities to follow through with job tasks; however, remaining successfully employed entails more than just accomplishing tasks of the job. All individuals in the study noted difficulty in interpersonal interactions with co-workers and employers. Challenges were noted in the following areas: understanding social expectations of interactions with typically developing colleagues; misunderstandings in social communication with employers; collaboration that was expected of them as a member of a team; and, experiencing sensory issues related to small cubicles, noise, phones, etc. in a crowded office situation. All of those interviewed reported that their

social deficits had made it challenging to find and maintain jobs commensurate with their ability.

The results of these studies suggest that it is difficult to catch up later in life in the area of social skills. Thus, lack of social competence translates into lost cultural and human capital, which refers to an individual's placement within a community according to the forms of knowledge and skills they contribute (Bourdieu, 1986).

Social skills deficits and the loss of social capital. Just as social competence relates to *human capital* and what an individual contributes to a workplace community, *social capital* describes the shared values and understandings in society that enable individuals to trust each other and so work together to contribute to a group (Bourdieu, 1986). Common themes are repeated throughout the literature about social needs of students with ASD: a desire to be accepted by peers, loneliness, exclusion from social opportunities, and the feeling of being stigmatized (Muller, Schuler, and Yates, 2008; Shtayermman, 2009). Although these students demonstrate social skills deficits, it may be the case that they seek social interaction but do not understand how to acquire it.

The Loneliness Rating Scale (Asher, Hymel, & Renshaw, 1984) is an instrument that assesses children's feelings of loneliness. This rating scale was administered to 45 elementary-age participants in a study by Bauminger et al. (2003). The researchers found that those students with HFA reported higher rates of loneliness than the neurotypical children on both emotional and social dimensions of the loneliness scale. A possible explanation suggested by Bauminger et al. (2003) was that those with autism might have less understanding of the relationship between loneliness and lack of social interaction.

Shtayermman (2009) conducted another exploratory study of the social stigma that individuals with autism experience. Ten adolescent-aged students diagnosed with HFA were selected to complete checklists on emotional responses to social situations. The researcher found that all of the students in the sample endorsed feeling stigmatized. After further diagnostic interviews, 20% of the participants met criteria for a diagnosis of a major depressive order and 30% were diagnosed with generalized anxiety disorder.

In a similar study that examined whether students with autism desired social connections, Muller et al. (2008) recruited 18 adolescents diagnosed with HFA to participate in an interview. Of the 18 participants, 17 reported a high level of isolation, and 15 expressed a desire for greater emotional intimacy with friends. All 18 students were able to list the social skills that were expected of them; however, all expressed confusion about how they could acquire the skills and were not sure when and where to use them.

These studies describe the loneliness and alienation experienced by many young people with autism, and touch on possible outcomes in adulthood that those early years presage. When individuals with ASD do not participate in the social networks of their communities, society is deprived of their contributions. Thus, the challenges of an individual with autism are magnified, and their estrangement from the community increases further.

Limitations of the Literature

A common research limitation of the literature was that parent surveys were a common form of data collection. Although it is understandable that parents were asked to serve as respondents on adaptive behavioral functioning and social skills assessments of

their children due to concern about perspective-taking deficits in those on the spectrum, there is always the concern about the bias of the parent. Without objective observation, the findings are limited by lack of independent verification. Several of the research projects may have been limited by a small sample size, as well, which should be considered. Available evidence-based research was also limited in special and education teacher collaboration.

Summary

Development of social skills throughout life affects vocational success, personal happiness, and interpersonal relationships (Stichter et al., 2012). An inability to read and imitate social behavior is common among those with autism, even high-functioning students, and necessitates that comprehensive social skills training includes generalization opportunities with neurotypical peers if students are to transfer what they have learned (Klin et al., 2003). Social skills provision in public schools, however, usually includes only the first two phases of social skills training - initial skills and practice (Rogers, 2000).

This literature review reveals possible drivers of economic, cultural, and social forces in public schools that contribute to the lack of implementation of a model that includes all necessary steps. Recent budgetary restrictions have resulted in fewer specialists being hired in the district, as in other districts nationwide (Goldberg, 2013). Due to high caseloads and assignments to several schools, as is also the case nationally (Ferney-Harris et al., 2009), specialists in the district are no longer available to consistently provide generalization opportunities for inclusion students with autism (Idol, 2006).

Traditional assumptions about separation between general and special education roles, and whose responsibility it is to promote generalization, is another area that contributes to the lack of generalization of social skills in an inclusive setting (Winn & Blanton, 2005). Although general education teachers attend IEP meetings and are aware of the social skills goals of their respective students with HFA, the provider indicated on the plan is special education staff. Confusion about provision of services can be minimized through administrative support of collaboration of special and education staff (Friend et al, 2010; Idol, 2006). Utilizing paraprofessionals to provide generalization opportunities in inclusive settings also has changed over the last few years due to budgetary cuts and growing concern that adult assistance can hamper social interactions and promote student dependence, since typical peers are often absent in this scenario (Carter et al., 2009).

Although this review focused on delving into possible reasons why the current model of social skills training does not include the last important step of generalization, some of the most compelling literature was revealed in the longitudinal studies that explored what the future might hold for those students with HFA who do not achieve social competence, as well as the lack of friends and occupation that might await them (Shtayermman, 2009). Findings of the literature review hold implications for the need to provide these students with comprehensive social skills training, and also suggest caveats for maintaining the current model of only the minimum provision of training. However, it will also be essential to survey stakeholders, such as parents and teachers of these students with HFA, to ascertain their perceptions of the adequacy of the current but incomplete social skills delivery model that is most prevalent in public school settings.

Chapter 3: Needs Assessment

Research suggests that in order for students with high-functioning autism (HFA) to generalize social strategies taught to them in a small group, subsequent rehearsal and practice of the new skills with typically developing peers in natural settings is required (Bellini et al., 2007; Koegel et al. 2012). According to research on social skills delivery models, however, pull-out from the general education classroom has been the predominant service delivery model used with HFA students in the United States over the last twenty years (Bellini et al, 2007; Gresham, 2001; Sunderland, 2004). There they receive an average of thirty minutes per week of instruction by a specialist working with two to three students who share similar social communication deficits (Gresham et al., 2001; Sunderland, 2004). Since the presenter is the adult specialist, this training provides no modeling of social skills by typically developing peers, and little to no opportunity for generalization within different contexts are presented (Bellini et al., 2007). Thus, this model does not necessarily promote transfer of skills for students with HFA (Bellini et al., 2007, Gresham et al., 2001).

A review of the literature supports the need for more effective social skills training for students with HFA beyond the traditional pull-out model (Koegel, et al., 2012; Owen-DeSchryver et al., 2008). The research revealed that without delivery of a comprehensive four-phase social skills program (i.e., skill instruction, practicing new skills with typical peers in natural settings, maintenance, and generalization), social, interpersonal, and vocational successes in the future are reduced (Bauminger et al., 2003; Muller et al., 2009). Obstacles to changing this service delivery model include assumptions about separation between general and special education roles, as well as a shortage of specialist staff time

due to budgetary restrictions (Ferny-Harris et al., 2009; Ploessl and Rock, 2014; Procter & Steadman, 2003).

Research Questions

One possibility for the continuation of this problem of practice is that the stakeholders (parents of the students, teachers of the students, and administrators of the schools) have not perceived a gap between the current social skills service delivery model and the potential positive changes associated with using the comprehensive training model. This key concern has generated four research questions:

RQ1: How successful do the stakeholders perceive the current social skills program has been in terms of affecting long-term skill development in their students?

RQ2: What factors do stakeholders perceive contribute to inadequacies in the current model of social skills service delivery?

RQ3: How difficult do stakeholders perceive it would be to effect change in the current model?

RQ4: How serious do stakeholders perceive the risk of consequences if current inadequacies continue?

A needs assessment was designed to explore these questions by surveying stakeholders' perceptions of the pullout service delivery model of social skills training of students with HFA who are in general education elementary settings within one large suburban school district. Participants included district teachers and parents of those elementary students who currently receive social skills training through the pull-out model in general education.

The survey utilized a mixed methods approach to collect data to be analyzed along four major factors: satisfaction with the current state of training; perceived need for change in the current model; perceived factors contributing to any inadequacy in the current model; and perceived risk of consequences if the model is not modified. Results of this needs assessment not only provided an avenue for teachers and parents to share satisfaction and concerns about the current delivery model, but also informed district service providers of aspects of the model that might benefit from modification in order to better serve students.

Documents and policies utilized in the needs assessment. All research, whether or not human interaction is involved, must follow the requirements of the Institutional Review Board (IRB), which includes application for approval. Thus, a signed consent form was required from all stakeholders who participated in the needs assessment (see Appendix A). Teaching staff and the parents of students with HFA in elementary general education were administered similar forms of the assessment. The differences between the two forms included purposeful wording (e.g., your "child" vs. "your student") to capture the responses of each respective respondent (see Appendices B and C).

Research Design and Methodology

The needs assessment was conducted in a large suburban school district with a total population of approximately 40,800 students, 45% of whom are in the elementary level. Approximately 95 elementary students per year in the district meet special education eligibility criteria for social skills training as a student with Autism Spectrum Disorder (ASD). These identified students are considered to be high-functioning and

attend classes in a general education elementary classroom and are pulled out of general education classes for social skills training with a specialist and one to three other students working on the same skills for an average of 30 minutes per week.

Two sets of respondents served as participants in the needs assessment. The first group of respondents included parents of the identified elementary students receiving social skills instruction via the pull-out delivery model. The second participating group, comprised of district staff, included: (a) specialists; (b) general and special educators; and (c) principals.

Staff respondents were selected from four district elementary schools because they had all participated in a professional development presentation on autism within the past two years; thus, an assumption was made that most of the staff in those schools would be familiar with the basic autism terminology used in the survey. After consent forms were returned, participants received the survey link electronically and then responded anonymously. Thus, there was no way in which respondents could be identified or connected with their responses on the surveys.

Sixty teachers across the four elementary schools were sent surveys after signing and returning their consent forms, and 42 teachers responded. Of the 42 surveys, 29 were complete and able to be included in the data.

Sixty parents of students with HFA who received social skills training via the pullout model within the same four elementary schools were chosen to be the parent respondents. Surveys were sent to the 30 parents who returned the consent forms. Fifteen of those surveys were returned, and 13 were completed in full (all items were

answered). However, 10 sets of partners (mothers and fathers) reported collaborating together in response on a survey, for a total of 23 respondents among the 13 surveys.

Variables Used in the Analysis

The needs assessment examined the following perceptions: (a) the respondents' perceptions of inadequacies in the current social skills delivery model; (b) perceived causes of such inadequacies; (c) the respondents' perception of the degree of difficulty in changing the current service delivery model; (d) and, their perception of long-term social skill development if changes were not met in the future.

Each of these questions was assessed via a mixed methodology survey that included qualitative and quantitative queries, in order to collect data to measure the perception of the participants, as well as why they perceived or did not perceive a problem.

Data Collection Methods

Teacher consent forms were distributed manually into staff mailboxes in one school, and electronically in the other three schools. Parents in all schools received electronic copies of the consent forms. After returning a signed consent form, the electronic link to the Needs Assessment Survey was sent to the participant, and the completed surveys were automatically and anonymously submitted to the Googled file to be scored (see Appendices A, B, and C). The quantitative responses were analyzed and summarized by the Google Analytics program. Primary level coding was utilized to structurally code the initial qualitative responses (Saldana, 2009, p. 51-52) and organize them into specific themes. A statistical analysis of any existing variances between the

responses of the independent variables (teaching staff or parents) on the quantitative queries was then conducted on the three major quantitative questions (see Tables 1-6).

Summary of Results

In order to establish the level of satisfaction with the current social skills service delivery model, participants were asked to rate how successful the current delivery service of social skills training at school has been for their students using a Likert Scale (1= Inadequate; 2 = Less than Adequate; 3 = Somewhat Adequate; 4 = Adequate; 5 = More than Adequate). The category range between inadequate to adequate was endorsed by 61.6% of the parents and 82.1% of the staff. None of the parent respondents endorsed the scale labeled as more than adequate, although 38.5% did rate the current training as adequate. Staff responses were relatively higher than the parents on both scales, resulting in a 10.7% rating of current skills as adequate and a 7.1% rating at the more than adequate level (see Figure 1).

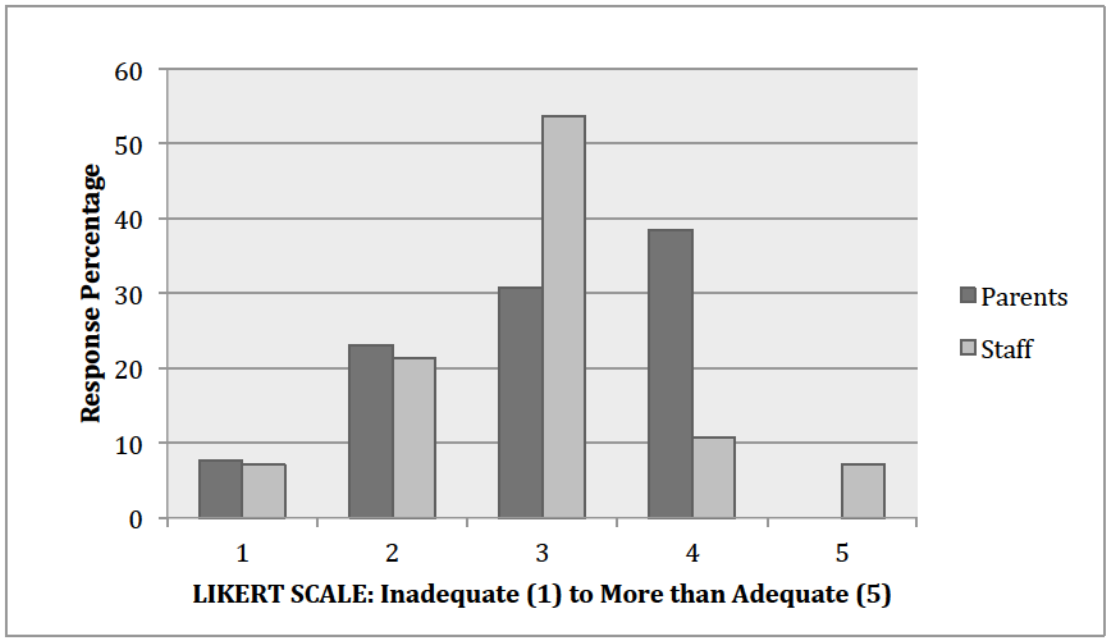

Figure 1. Rating of satisfaction with current delivery service of social skills training for students.

When queried whether they perceived the current service delivery model of social skills training as adequately meeting the needs of their students, 15.4% of the parents responded *yes*, 38.5% responded *no*, and 46.2% endorsed *somewhat*. The staff respondents' breakdown of responses was 3.6% *yes*, 17.9% *no*, and 78.6% *somewhat* (see Figure 2). Participants who did not respond to the above question affirmatively were routed to another page on the survey rating possible factors related to inadequacies.

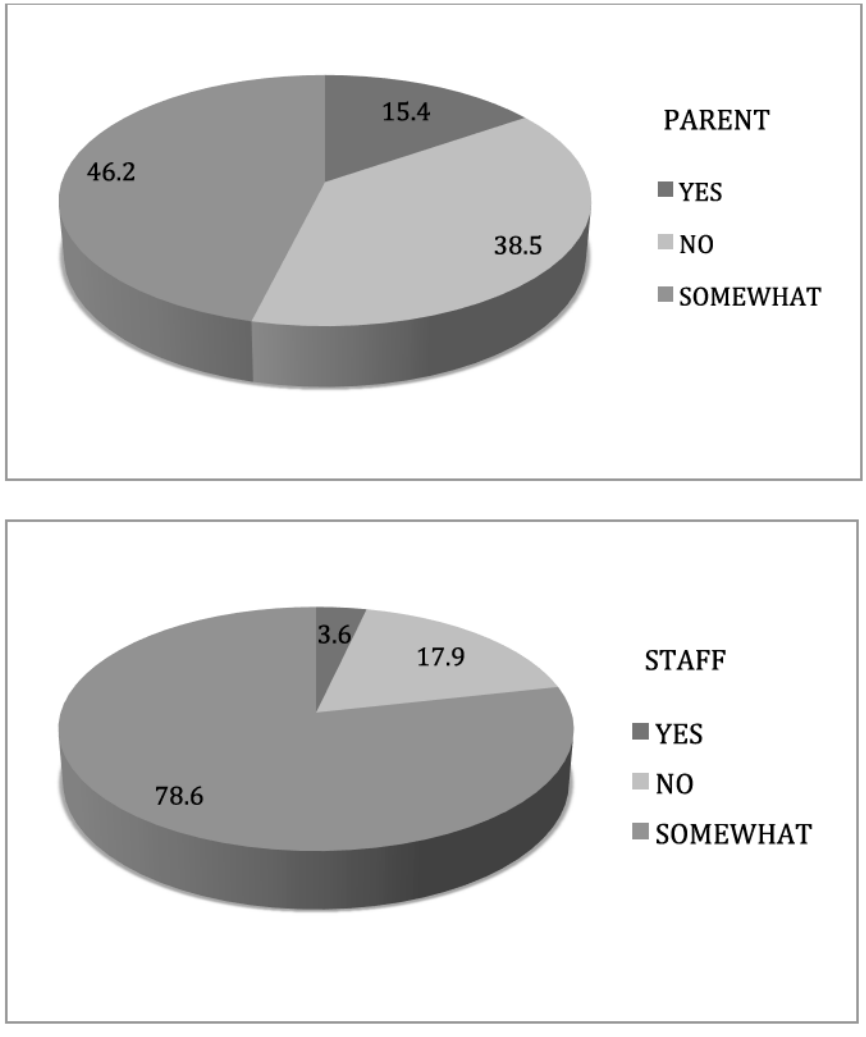

Figure 2. Parent and teacher responses to survey query: Does the current social skills program adequately meet training needs of your students?

The most highly endorsed perceived cause for inadequacy in the current model in both groups of respondents fell within the within the lack of maintenance of learned skills with general education peers in the classroom, which was selected by 72.7% of the parents, and 77.8% of the staff (see Figure 3).

Each perceived cause of inadequacy in the current model was followed up by a query of how possible the participants perceived it to be to make changes to that specific problem area. When asked how difficult it would be to make more time for practice of learned skills with general education peers in the classroom, 81.9% parents and 88.4% staff responded "difficult to very difficult".

The lack of enough time allocated for training with the specialist was also highly endorsed as a cause of inadequacy of the current model by 63.6% of the parents and 44.4% of the staff. When asked how difficult the participants perceived it would be to allocate more specialist time for skills training, 72.8% of parents and 92.3% staff rated it as "difficult to very difficult."

A lack of time to practice and generalize skills in natural settings was endorsed as contributing to the inadequacy of the current model, by 81.8% of the parents and 59.3% of the staff. When asked how difficult they perceived it to be to add more generalization opportunities with trained staff in natural settings (recess, lunch, etc.), 90.9% of parents and 80.7% of staff considered it to be "difficult to very difficult".

When queried how difficult they perceived it would be for the school to address changing the current model enough to provide adequate staff social skills training needs in their school, 91.0% of parents and 88.8% of staff endorsed "difficult to very difficult". Finally, when asked how seriously they would rate the risk of negative

consequences for their students' development of social competence if no changes were made to the current model, 100% of the parents and 88.8% of the staff rated it "serious to very serious".

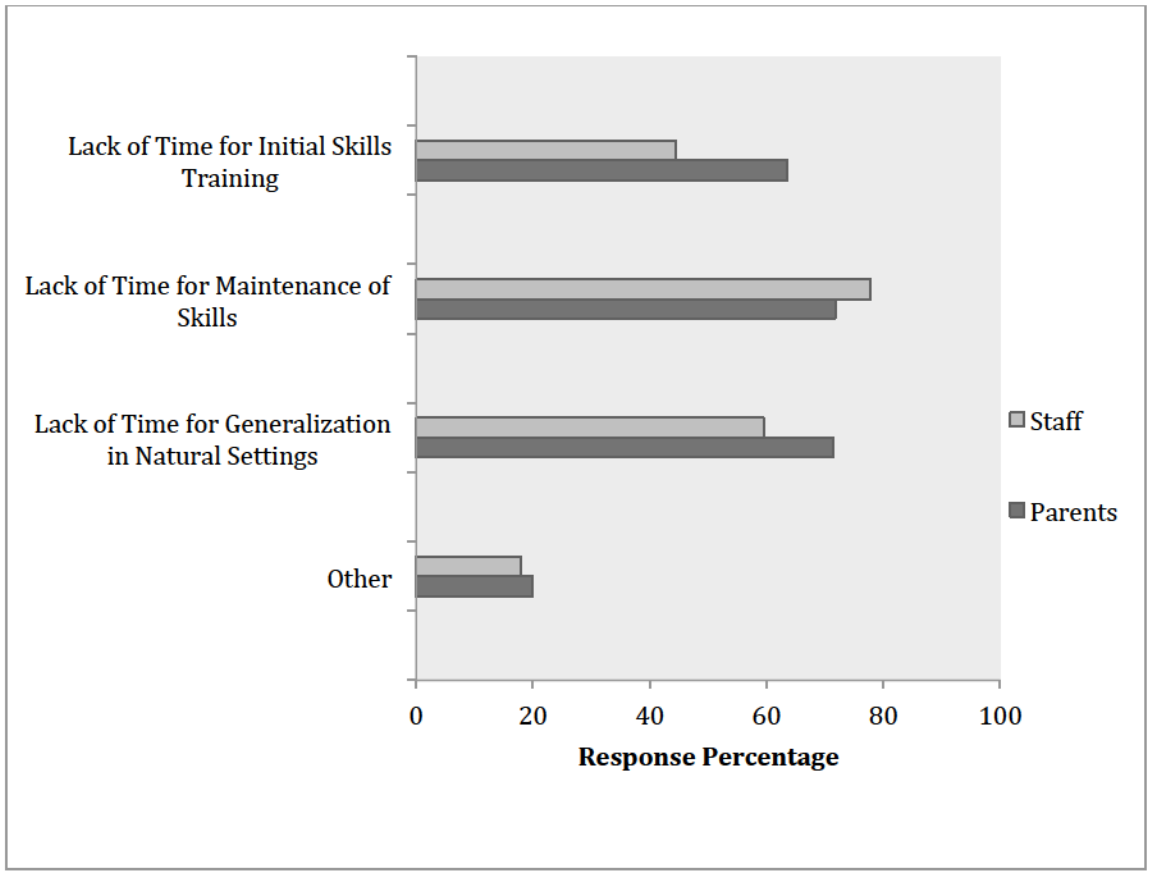

Figure 3. Contributing factors and causes of inadequacies in skills training.

Respondents were then presented with a qualitative open-ended query asking them to list any causes that were not included on the previous question's response list but were, in their opinion, major contributors to the program's inadequacy. Primary level coding was utilized to structurally code the initial qualitative responses (Saldana, 2009, p. 51-52), combining both parents and teachers, and organizing them into specific themes that are displayed in Table 1.

Table 1

Major Themes by Response Percentage to Qualitative Question: Other Contributing Factors to Inadequate Social Skills Training Reported by Respondents

% Response	Themes
13.3	Social skills lessons once a week not adequate time allotted
13.3	Administrative building assignment of specialists to only two days/week is inadequate
23.3	Administration's teacher expectations do not include building social skills competence
20.0	Not adequate time for teacher collaboration with specialists
20.0	Structured interaction time between typical peers and those with autism is missing

Further concerns were expressed through response to a qualitative question about possible consequences to students when considering the possibility that no modification of the current social skills delivery model could occur. Three themes that prevailed along both respondent groups categorically during the data decoding initial process (Saldana, 2009, p. 51) were: (a) students on the spectrum would not have opportunities to practice outside of lessons with typical peers; (b) students would not feel comfortable initiating conversations without adults to prompt them unless trained to do so, and; (c) they will experience more social problems when they reach middle school without further training than they currently receive (see Table 2).

Table 2

Major Themes by Response Percentage to Qualitative Question: What are some of the possible consequences that concern you when considering no modification of the current social skills delivery model?

% Response	Themes
64.8	Students will not have opportunities to practice outside of lessons with typical peers
27.1	Students will not feel comfortable initiating a conversation without prompts from adults
8.1	Students will experience even more social problems when they enter middle school

Another open-ended question gave respondents the opportunity to suggest improvements to the current program. The major themes that were coded provided the following suggestions: Increase training for general educators on this topic; allow more time for collaborative support between general and special educators; increase specialist time in the building, and; train and use peers to help students with autism generalize their social skills (see Table 3).

Table 3

Major Themes by Response Percentage to Qualitative Question: What overall improvements can you suggest for the current social skills training program of your students in school?

% Response	Themes
27.78	Provide more training for general educators on this topic
16.67	Allow more time for collaboration between general and special educators
23.23	Provide more specialist time in the building
32.32	Train and use peers to help students with autism generalize social skills

Comparison of the means of responses on three questions of import was conducted via a two-tailed t-test using a 95% confidence interval (see Table 4). The results of the question exploring whether respondents perceived inadequacy in the current model of service delivery indicated a statistically significant difference between staff that rated the model as more inadequate than did the parents at a 10% significance level (p-value = 0.071). For such a small sample size, this is significant.

When asked to rate how seriously at-risk these students' social competence development would be if the current model was not modified (see Figure 4), the responses similarly resulted in a statistically significant difference between parents who, overall, rated the consequences as more serious than did teachers, at a 15% significance level (p-value = 0.134), also a large significance for a small sample (see Table 5).

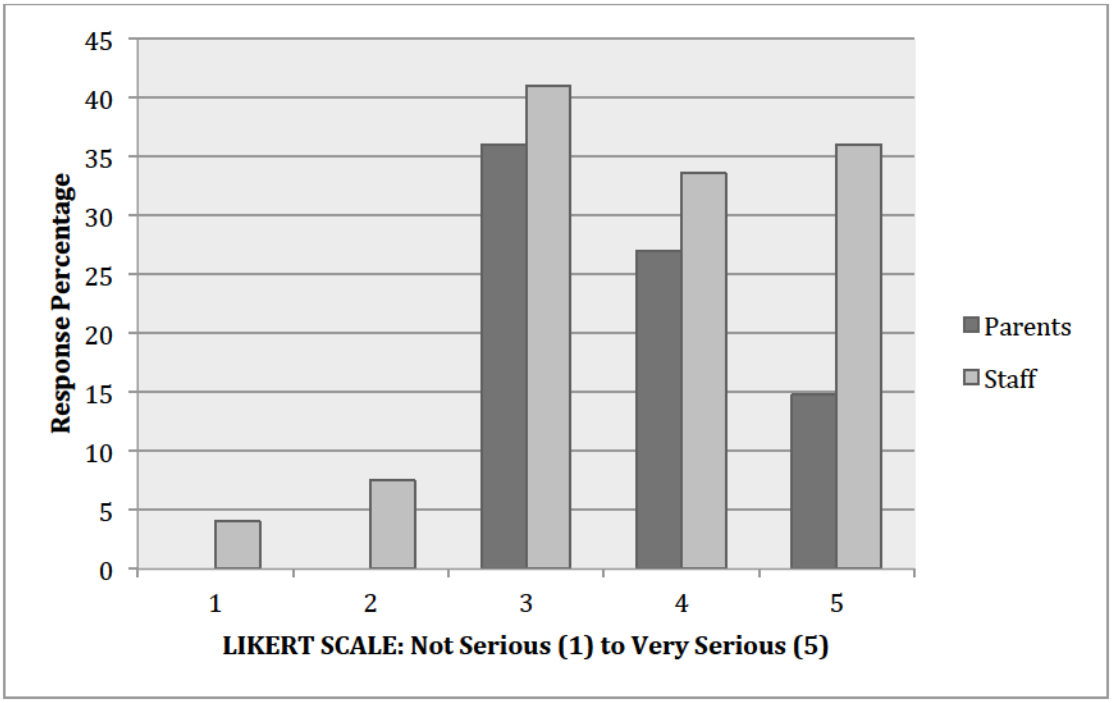

Figure 4. Responses to survey question: If the service delivery of social skills training in your school remains within the current state, how seriously do you rate the risk for your students' development in social competence? (Scale: 1= Not Serious to 5= Very Serious).

Table 4

T-test: Hypothesis: No Significant Difference between Means of Parent and Staff Responses to: "Do you perceive the current service delivery model of social skills training to adequately meet the needs of your student(s)?"

Respondents	*n*	Mean	*t*-call	do	*p*	95% Confidence Interval Lower / Upper	Decision
Parents	20	2.308	-1.922	17.51	.071	-.927 / .042	Reject
Staff	30	2.750					

Table 5

T-test: Hypothesis: No Significant Difference between Means of Parent and Staff Responses to: "If current model is not changed, how seriously do you rate the risk for your student's development in social competence?"

Respondents	*n*	Mean	*t*-cal	df	*p*	95% Confidence Interval Lower / Upper	Decision
Parents	20	4.000	1.558	21.00	.134	-.174 / 1.211	Reject
Staff	30	3.481					

An additional *t*-test was conducted on the responses to the question asking for perception of difficulty in requiring that the district address what the respondents perceived as inadequate social skills training needs in the school. Once again, the differences in responses were statistically significant (p value = 0.118) as parents' perceptions of making modifications in the school setting was rated as more difficult than teachers' perceptions of doing so, at a 15% significance level (see Table 6, below).

Table 6

T-test Results: Hypothesis: No Significance between Means of Parent and Staff Responses to: "How difficult do you perceive it would be for the school to address what you see as inadequate social skills training needs in your school?"

Respondents	*n*	Mean	*t*-cal	df	*p*	95% Confidence Interval Lower / Upper	Decision
Parents	20	4.091	1.656	15.42	.118	-.194 / 1.561	Reject
Staff	30	3.407					

Discussion of Needs Assessment Results

Ratings by the majority of respondents completing the survey within this large suburban school district indicated dissatisfaction with the current service delivery model of social skills training for elementary students in general education with HFA. The majority of respondents endorsed a perceived need to provide more time for maintenance and generalization opportunities with typically developing peers for those students with autism. Both groups of respondents were in agreement about the serious implications for their students' social competence with only the current social skills training available to them. One hundred percent of the parent respondents and 88.8% of the staff respondents rated the risk of negative social consequences for their students as serious to very serious if no modification to the current delivery model occurs.

Conclusion

A needs assessment provides information to staff members and parents about what is happening in their organization and gives them an opportunity to discuss their ideas and opinions about specific issues (Soriano, 2013). This needs assessment provided an avenue for staff and parents to share satisfactions and concerns with the

current delivery model, but can also inform district service providers of aspects of the model that might benefit from modification in order to better serve the target students. These survey results suggest that stakeholders in the school district perceive a need for a future social skills model that includes practice and maintenance of skills through generalization across natural settings. Further, these district stakeholders' perceptions warrant a review of the literature of the most successful social skills interventions for this population that could potentially supplement the more prevalent model.

Chapter 4: Literature of Interventions

In response to the results of one district's recent needs assessment indicating serious concern by stakeholders about adequacy of the current social skills service delivery model, a literature review was conducted to explore current social skills interventions that entail not only teaching skills and providing practice, but also in maintaining and generalizing those new skills in natural settings across a variety of peers. The selection of an intervention is always contingent upon the level of impairment that a student with autism demonstrates, and so the following factors affecting students with HFA were considered (Bauminger et al., 2002).

A Range of Impairment

The characteristics of ASD in adults and children fall on a continuum from mild to severe impairment. The DSM-V defines these parameters based on independence and need for supports: (1) requiring some support (high-functioning), (2) requiring substantial support (medium-functioning), and (3) requiring very substantial support to function (low-functioning), in many areas (American Psychiatric Association, 2013). Because students with high-functioning autism (HFA) can navigate the academics of a general education classroom and their behaviors are not typically disruptive, they are usually placed in inclusive general education settings and typically receive social skills delivery via a pull-out model (Ferney-Harris et al., 2009).

According to the American Psychiatric Association (2013), differences in the quality of reciprocal communication and social interactions are exhibited across a range of developmental and intellectual levels in the autism spectrum. Thus, in spite of their demonstration of relatively less severe impairment than those students in the low to

moderate functioning categories of intellectual disabilities, individuals with HFA can be seriously impaired socially (Scheeren et al., 2012). According to studies by DiSalvo and Oswald (2002), students with HFA initiate more social interactions with adults than they do with peers in unstructured settings, as compared with typically developing students.

Social Needs of Students with High-Functioning Autism

Inclusive classroom placement often provides opportunities for students with HFA to interact with typically developing peers, who are defined as students without an identifiable disability that requires intervention of special education services. Varying difficulties in deciphering social cues, however, may frequently ostracize students with HFA from those peers (Chamberlain et al., 2007; Ingram et al., 2007).

As social demands increase for all students approaching middle and high school, those students with HFA tend to become more aware of their difficulties in developing friendships and relating to same-aged peers (Attwood, 2005). Such a lack of social success often leads to loneliness, depression, and anxiety, and can eventually affect those with HFA entering adulthood as they attempt to function independently, establish vocational success, and succeed in interpersonal relationships (Bauminger et al., 2002; Bellini et al., 2007). Thus, it is reasonable to put strategies into place during childhood for these students, so as to increase their chances to develop social competence.

Social competence, an essential element of human development, is an extremely important attribute to develop at a young age (Rodriguez, Smith-Canter, & Votic, 2007). Social competency relates to utilizing social skills across different settings, different contexts, and with different people to satisfy one's social needs (Stichter, Randolph, Gage, & Schmidt, 2007). These skills include maintaining eye contact, initiating

interaction with others, responding to initiations from others, and inferring the interests and needs of others (American Psychiatric Association, 2013). Past studies have suggested that positive development in cognitive processing, emotional regulation, and problem solving in social situations tend to be influenced by social participation and result in social acceptance (Odom, Zercher, Shouming, Marquart, Sandall, & Brown, 2006). However, students with HFA need targeted and specific instruction in linking emotions to different social situations, interpreting social cues, and understanding their peers' perspectives (Bauminger et al, 2002).

Prevalent Social Skills Service Delivery for Students with HFA

Students with HFA often demonstrate deficits not only in reading the social environment, but also in differentiating between contexts (Chevallier et al., 2012). Recent research suggests that evidence-based approaches including the four steps of social skills training (teaching skills, rehearsing them in a small setting, generalization in natural settings with typical peers, and staff monitoring for skills maintenance over time) can have the most sustainable impact on all aspects of a student's social skills (DiSalvo & Oswald, 2002; Kasari et al., 2012; Koegel et al., 2012).

According to research on social skills delivery models, however, pull-out has been the predominant service delivery model used with HFA students in the United States over the last twenty years (Bellini et al, 2007; Gresham et al., 2001; Sunderland, 2004). This type of intervention is referred to as pull-out since the child is removed from the classroom curriculum for a specific amount of time (Vicker, 2009). Sessions are typically held weekly with two to three students who are all working in isolation on the same IEP social goals (Ferny-Harris et al., 2009; Vicker, 2009). As they learn skills,

students can practice and role-play with each other in the small-group setting through staff facilitation (Vicker, 2009).

There are several drawbacks to this current service delivery model. The presenter is, by design, an adult provider and the students in the session all share the same communication deficits, so there is no modeling of social skills by typically developing peers within the setting (Ferney-Harris et al., 2009; Bellini et al., 2007). Thus, students may not generalize skill usage to the classroom, home, and community (Vicker, 2009). Many students may even believe that the new skills should only be used in the therapy room, so then resist efforts to get them to use newly learned behaviors in other contexts (Vicker, 2009). Although the time allocated for this model meets minimum requirement for the IEP, it does not progress beyond the first one or two steps of training considered necessary for best practice (Williams-White et al., 2007). Thus, a pull-out model does not necessarily promote transfer of skills for students with HFA (Bellini et al., 2007, Gresham et al., 2001).

Making a Decision about Social Skills Models for Students with HFA

According to Gresham, Elliott, and Kettler, (2010), students with HFA require explicit instruction around their respective social skill deficits, as well as opportunities to generalize newly learned skills. The literature indicates that evidence-based studies incorporating these components, as well as resulting in increased social competence, can be divided into two categories: adult-mediated and peer-mediated interventions (Odom et al., 2010; Rogers, 2000).

Past studies suggest that social maturity differences between those with, and those without, HFA can be ameliorated when students with HFA rehearse and generalize

new social skills while engaging in play situations with typically developing peers (Koegel et al., 2012; Sperry, Neitzel, & Engelhardt-Wells, 2010). Adult-mediated interventions can provide the explicit training, but do not necessarily generalize the learned skills in naturalistic contexts, such as with peers at lunch or recess (Kasari et al., 2012; Owen-DeSchryver et al., 2008).

Although there have been clinical interventions and university research studies demonstrating the need for social skills training that includes maintenance and generalization phases with typically developing peers within a social skills training model (Rogers, 2000), very few public schools have followed through with these last two stage*s* (McFadden et al*.,* 2014; Williams-White et al., 2007). Social skills training that includes teaching peers to model and initiate social interaction could also address any shortage of staff as progress monitoring could be effectively provided by special education staff for short periods of time after completion of peer training, using some of the time that is currently allocated for pullout training (Chan, Rispoli, O'Reilly, Sigafoos, & Cole, 2009).

Selecting the most appropriate model of social skills training is also dependent upon the type of social skills deficits exhibited by a student (Battaglia & Radley, 2014). Three types of social skills deficits are recognized that predict the most useful skill instruction: acquisition, performance, and fluency (Battaglia & Radley, 2014; Bellini et al., 2007). Acquisition describes the ability to learn and understand the social skill (Battaglia & Radley, 2014); performance is not only understanding, but also choosing to perform, a skill (Battaglia & Radley, 2014), and; fluency is described as knowing how, and desiring, to perform a social skill, but remaining awkward in following through in

natural settings (Gresham et al., 2010). There is always the possibility that the student is not motivated because this activity has not been successful or reinforced in past interactions (Gumpel, 2007). Skills deficits in fluency may also emerge due to a lack of exposure to socially competent peers. Instructional methods that target deficits in fluency skills include: (a) modeling appropriate social skills by typically developing peers, (b) providing numerous opportunities to practice appropriate social skills with peers, and (c) reinforcing the fluid execution of social skills across natural settings and time (Battaglia & Radley, 2014; Gresham et al., 2010). Thus, students with HFA and fluency deficits in social skills could be responsive to a model that includes mediation of social skills by typically developing peers in natural environments. Peer-mediation meets all of the criteria listed above for provision of social skills training in natural settings with typically developing peers.

A Peer-Mediated Model of Intervention

Utilizing trained peers to mediate practice and generalization of social skills and self-regulation has been a strategy examined in research throughout the past twenty years with students demonstrating executive functioning and social deficits (Carter et al., 2005; Owen-DeSchryver et al., 2008). Executive functioning and social deficits can negatively impact development of the social communication and emotional regulation skills that students will need out in the community, in the classroom, and on the playground (Carter et al., 2005; Owen-DeSchryver et al., 2008; Rao, Beidel, & Murray, 2008). Social skills training includes goals to generate positive changes in each student's emotional and behavioral regulation skills in order to increase social competence (Rao et al., 2008). Peer-mediated interventions have been successful in training peers to increase

social interactions at higher levels than just ensuring proximity of a typically developing peer near a student with HFA (Stichter et al., 2007).

Peer-mediated Instruction and Intervention (PMII) is a program that involves training typically developing peers to provide necessary instruction and mentoring in areas of concern, such as social skills and behavior challenges (Chan et al., 2009). This intervention requires diligent selection of the peers, and providing them with specific training so that they can facilitate social interaction with adult monitoring (Carter et al., 2005).

In PMII, typically developing peers may facilitate social interactions by modeling appropriate social skills, while prompting the target students to respond to and initiate with others, all the while reinforcing the appropriate behavior when it occurs (Battaglia & Radley, 2014). The peer trainers are chosen from the target students' milieu, and receive training and close observation during the mediation process (Koegel et al., 2012). One of the advantages in utilizing peer trainers is that target students may integrate more fully in their peer group without adult interference (Battaglia & Radley, 2014).

Social cognitive theory acknowledges social learning differences between typically developing students and those with autism (Buron & Curtis, 2012; Klin et al., 2003). Peer-mediation interventions have roots in principles of learning theory, according to Sperry et al. (2010). Social learning theory is associated with learning through observation and relates to observational learning as a way to model for others to acquire new skills, perform, and generalize those new skills (Bandura, 1977). According to Vygotsky (1978), the process of learning is uniquely social and takes place, along

with development, as children interact with each other. The concept of using peer trainers capitalizes on his theory that learning occurs when a child (the target student) interacts, while in the proximal zone of development, with another person (the peer trainer) who is more experienced in a skill (Vygotsky, 1978).

PMII methods can be time-consuming to implement and require that the peers follow proper strategies and techniques. These can both be considered drawbacks, however, several studies have suggested that PMII can result in successful social integration for students with HFA and the time-consuming training of peers only occurs upfront at the beginning of the model (Harper et al., 2008; Koegel et al., 2012).

There are different combinations of peer and target students in various models of PMII, including peer modeling, peer initiation training, teaching a social script, and specific instruction to both the target students and the peers. Research suggests, however, that a combination of all of these components increases the likelihood that the peer trainers will follow implementation with fidelity and that the students with autism will follow through with social engagement (Chan et al., 2009; Zhang & Wheeler, 2011). When both peers and children with autism are trained, an added social reinforcement from peers may promote an increase in ongoing interactions (DiSalvo & Oswald, 2002).

The PMII model has been considered a useful intervention in completing the process that is started in the IEP mandated social skills training of weekly training via pull-out services (Battaglia & Radley, 2014). With more HFA students placed in inclusive general education settings, this method also provides facilitation of social connections with their classmates (Battalgia & Radley, 2014). Although peer trainers in

this model facilitate social skills training, there is also a need for adult staff involvement, not only in providing the peers with strategies, but also in progress monitoring; however, once the model is installed, time commitment lessens for staff progress monitoring only once or twice per week (Carter et al., 2005). When this intervention is carried out on the natural setting of the playground, there is no loss of classroom instruction time and little to no work for teachers if specialists use time typically allocated to small group training to begin the implementation procedures.

The peers who undergo training to mediate the social skills of the students with HFA also receive benefits. Carefully selected and trained typically developing peers can eventually become stakeholders in the success of their buddies as they interact with them several times a week (Kasari et al., 2012). Throughout the training, as well as during the intervention, peers can benefit from an increase in empathy, understanding, and tolerance for differences as they work with students with HFA (Williams-White et al., 2007). Overall, mentoring as a peer buddy promotes leadership skills, and develops a sense of responsibility (Carter et al., 2005). Mentoring can be fulfilling in that improving another student's life makes one feel useful, and the chance to make that kind of positive impact is a priceless experience (Carter et al., 2005).

Thus, PMII is an intervention that provides a possible solution to the problem of practice of currently presenting only partial social skills training that students with HFA need to be socially competent (Battaglia & Radley, 2014). Utilization of an evidence-based practice uses (a) sounds research design, (b) is based on high quality data analysis, and (c) has been peer-reviewed for methodology (Odom, Collet-Klingenberg, Rogers, &

Hatton, 2010). Thus, the literature review that follows will investigate the possible evidence-based components of this intervention.

Ideal settings for peer-mediation at school include classrooms, lunch, and recess. According to Harper et al. (2008), recess appears to provide more of a naturalistic setting than the other two settings. Given the growing focus on standards-based instruction in schools, children's social opportunities at school have increasingly dwindled (Harper, et al., 2008). Yet, recess is a highly social, largely unstructured portion of the school day that provides a multitude of opportunities during which to learn social communication skills that are appropriate and successful. While the most common setting for the majority of past social skills interventions has been in a clinical study with participants from different schools across an area, the contrived social setting is not usually conducive to generalization (Kamps, et al., 2002; Pierce & Schreibman, 1995). Despite their status as an evidence-based practice, however, peer mediated social skills interventions are not yet commonplace in school settings (McFadden, Kamps, & Heitzman-Powell, 2014).

The long-term goal of any social skills intervention is to ensure maintenance and generalization of skills across settings, behaviors, people, and activities (Stokes & Baer, 1977). Selecting target behaviors and teaching them in the environment in which they are to be used makes it more likely that they will be controlled by naturally occurring stimuli following the withdrawal of intervention, thus facilitating maintenance (Stokes & Baer, 1977).

Selection of Articles in the Literature Review

A literature review of peer-mediated intervention studies was conducted to examine: (a) the participants; (b) methodology and design; (c) implementation process; (d) outcomes; and (e) data analysis components of this experimental/quasi-experimental intervention. Since social competence deficits can accrue exponentially over time (Ingersoll et al., 2001), addressing the problems of the current pullout model of social skills delivery while students are still in public elementary schools allows more time for utilization of the treatment before a student arrives in the highly socially complex realm of middle school. Students in many school districts who are seriously impacted by autism and demonstrate adaptive functioning skill deficits are often placed in small, self-contained classrooms with trained staff and embedded social skills training (Williams-White et al., 2007). Thus, the primary exclusion/inclusion for search protocols in this literature review aimed to find studies that included elementary students with HFA in general education settings, as these participants typically receive only a once-per-week social skills delivery model that does not include generalization of skills.

Further inclusions and exclusions required the author to utilize search protocols in various databases for the following criteria: (a) studies were conducted within the last ten years in peer-reviewed journals; (b) target students were either diagnosed with autism or who received special education services as students with an Autism Spectrum Disorder eligibility; (c) target students were considered high-functioning as indicated by assessed cognitive ability within at least the average range; (d) target students were not currently participating in private social skills therapy; (c) target had received, or were currently receiving, social skills training in school through a pull-out model once a

week; (f) participants were enrolled within elementary grades in public school settings (and not in a clinical setting); and (g) the intervention was conducted within natural social school settings (e.g., lunch, recess).

Further utilizing Cornelius and Nagro's (2014) search methodology, articles obtained from the original database search were reviewed for any additional studies that might have been rejected by the database platforms. Journals featuring peer-reviewed articles on developmental disabilities, social thinking, and autism were also perused. The original total number of studies gleaned from the search was fifteen. After eliminating meta-analyses, the list was reduced to nine studies; however, three of those studies were eliminated because they included peer training by clinicians in their institutional settings.

According to Horner, Carr, Halle, McGee, Odom, and Wolery (2005), multiple-baseline design has been indicated to be a strong evidence-based practice as it can clearly demonstrate that participants perform better during intervention than in baseline. It is also a single-case design that has met the evidence-based indicators of repeated positive results over numerous studies conducted in separate locations by different researchers (Horner et al, 2005). Thus, each of the six studies discussed below includes multiple-baseline design.

Literature on Peer-Mediated Interventions

Owen-DeSchryver et al. (2008) conducted a six-month multiple-baseline design study of three students with autism and seven peer-buddies who initiated peer interactions after being trained by interventionists. The results indicated an increase in target students' social initiations and verbal responses at recess over baseline (Owen-

DeSchryver et al., 2008). Untrained peers also initiated play with the target students at recess, which was unexpected and was attributed to a halo effect related to the peer trainers' apparent enjoyment with the target students (Owen-DeSchryver et al., 2008). The authors of this study cited previous research as the reason they designed the intervention to include more peers than target students, suggesting that generalization of social behaviors between typical peers and students on the spectrum may improve in the presence of multiple trained peers (Owen-DeSchryver et al., 2008). A limitation cited by the researchers was that social validity data were not collected in the study, to which they added a suggestion that this important indicator be included in future research in this field.

Hundert, Rowe, and Harrison (2014) conducted a similar study of two sets of three elementary students with HFA utilizing peer-mediated social skills training in a multiple baseline design. In this peer-mediated intervention, the first set included one trained peer paired with each of the target students, using a social script to facilitate social engagement. The second set of three students had typical peers paired with them who were untrained and did not use a social script. Only students who were taught social scripts and then given opportunities to practice with peer buddies demonstrated generalization of skills three months later (Hundert et al., 2014). Treatment fidelity of 94% was met in these sessions, although the author noted two major limitations: there were only three students who received social scripted initiations, and the scripts were written by the clinicians instead of by teachers who knew the students better (Hundert et al., 2014).

Koegel, Vernon, Koegel, Koegel, and Paullin (2012) conducted a study that identified activities that were of interest to the target students before gathering together trained typical peers who joined the target students in social clubs twice weekly during regular lunchtime periods. The number of unprompted social interactions and frequency of social engagements were examined as dependent variables. Results indicated that both of these dependent variables increased throughout the intervention. The authors discussed the benefits of utilizing, or at least incorporating, the thematic play and game interests of students with ASD in social interventions to increase interactions with others. Inter-rater reliability of engagement with peers was calculated to be 99%, (range, 94%–100%), and the average inter-rater reliability for unprompted initiations was 95%, (range, 82%–100%). Fidelity of implementation by the adult facilitator was found to be consistent with the principal researchers' instructions to her, so was assumed to be close to 100%. A limitation of this study, however, was the possibility that the adult facilitator's direct involvement with the target students could have possibly reduced their direct interactions with the peers.

Mason, Kamps, Turcotte, Cox, Feldmiller and Miller (2014) conducted a study to examine changes in target students' interaction after trained peers facilitated social skills during recess in an elementary school. Two of the target students were from different classrooms within inclusive settings, and one target student was in a self-contained classroom. Six peer trainers were selected from the three target students' classrooms and were trained by the researchers in modeling social behaviors. During the intervention phase of the study, the peer trainers modeled appropriate social communication interactions with the target students while staff interventionists

prompted. The dependent variable - the number of communicative acts that target students made toward the peer models - showed an immediate and steady increase during the intervention phase. Calculation of fidelity of implementation in training peer resulted in a mean score of 94% (range = 80-100%). The measure of intra-observer agreement among the observers resulted in a mean score of 85% (range = 82-90%) in their coding of behaviors among the three target students. Social validity was examined by utilizing the *Recess Implementer Survey*. Limitations of the study included a lack of maintenance probes to gauge long-term effects of the intervention.

Harper et al. (2008) utilized Pivotal Response Training (PRT) to specifically target social initiations in their study. The target students who worked with peer buddies only in the classroom made less significant gains than those who played with them at recess. Harper et al. (2008) also advised exposing target students to multiple peer buddies for more maintenance and generalization. Fidelity of implementation was reported at 94% among the peer trainers. Harper et al. (2008) discussed the benefits of using Pivotal Response Training (PRT) techniques, thereby specifically targeting social initiations, and they also advised exposing the target student to multiple peer buddies, as their research has shown that it promotes maintenance and generalization. Utilizing recess and other unstructured times improved the strength of generalization, whereas peer buddies who worked with students on the autism spectrum only in the classroom made less significant gains (Harper et al., 2008). An extraneous variable that was noted to be limiting was the cognitive difference between the students (ranging from borderline to high average). Additionally, the authors suggested conducting more

generalization probes several months after the peer training process in future studies (Harper et al., 2008).

McFadden et al. (2014) also utilized PRT in their study that examined the effects of the Peer Networks Recess Intervention (PNRI) project in which training for buddies was school-wide and included pre-recess huddles, peer-prompting, feedback, and post-recess discussions. The four target students also attended several short lessons per week to practice social interactions and initiations to play. The peers of the target students practiced what they had learned in their sessions about Pivotal Response Training (PRT) and modeled how to initiate play, respond to a request to play, and take turns with the target students at recess. Social validity was evaluated by administering pre- and post-intervention checklists on target students' social skills. The responses of the teachers in the classroom and on the playground indicated an increase in the target students' social interactions with peers after the study. Among the four target students, social initiations increased on the average from pre-intervention observations of 5% to 23% of observations post-intervention (McFadden et al., 2014). One of the limitations of this study cited by the authors was that only social communication was the dependent variable focus, but that other features of social engagement should be studied in the future.

Table 7 includes a list of the six studies reviewed, as well as a synopsis of the participants, purpose of the study, design and methodology, variables, outcomes, and reliability, validity, and treatment fidelity results. The review and discussion of the individual studies suggested commonalities across the components of their research approaches that included evidence-based practices. The review of these six peer-

mediated intervention studies suggests that successful outcomes were partially due to commonalities: multiple-baseline design, use of multiple peer buddies, treatment integrity measures, and the naturalistic setting of recess on the playground. Probes at least one month later demonstrated skill generalization in three of the studies, two of which utilized PRT.

Limitations

Limitations cited in these studies noted inclusion of either one or no female target students occurring in several studies, which possibly moderated the role of peer gender. According to Lai, Lombardo, Auyeung, Chakrabarti, and Baron-Cohen, (2015), most autism studies have historically tended to include participants based on currently accepted statistics of a greater ratio of autism diagnosed in boys than girls, or they opt to include only males in a study.

It was also noted by several of the authors of the studies that the small number of peer buddies assigned to the target students cited in the studies made generalization somewhat difficult (Harper et al., 2008). Recommendations included increasing the numbers of trained peers to provide more exposure and generalization opportunities for the target students (Harper et al., 2008; Hundert et al., 2014. This suggestion has been noted in recent literature suggesting that observing multiple social models instead of only one peer trainer may increase performance, acquisition, and generalization of social skills as the target student is exposed to diversity in social skills styles (Bellini & Akullian, 2007; Carter et al., 2005; DiSalvo & Oswald, 2002; Scheeren et al, 2012).

Another limitation cited by Owen-DeShryver et al. (2008) was that social validity data was not collected in their study, to which they added a suggestion that this important indicator be included in future research in this field.

Implementation fidelity is essential in determining an intervention as evidence-based (Conroy, Gage, & Stichter, 2011). Although all but one of these reviewed studies included treatment fidelity, it has often been missing in many recent studies. Chan et al. (2009) conducted a meta-analysis of peer-mediation studies and found that only 14 out of 42 reported treatment of fidelity and that less than 23% reported fidelity for peers. It should be noted that the absence of this measure makes it difficult to determine whether or not the intervention was implemented as it was intended which makes it an indispensable component of any intervention.

Studies other than those that were reviewed have also suggested consideration of the impact of peer trainer selection and recommended investigation into whether or not random assignment leads to increased generalizability (Koegel et al., 2012). Thus, matching target students and peer trainers through use of compatibility measures is also suggested.

Summary

This literature review has discussed how the PMII model can be highly effective for students with HFA (Harper, Symon, & Frea, 2008). The PMII model also meets criteria for an evidence-based practice according to criteria proposed by Gersten et al. (2005). Another factor supporting the selection of this intervention method is the National Standards Report from the National Autism Center (NAC) that deems peer-

mediated interventions to be established and evidence-based treatments for individuals with Autism Spectrum Disorder (National Autism Center, 2009).

The limitations and recommendations discussed in the six examined literature articles served as a basis for the methodology decisions surrounding a social skills intervention utilizing peer-mediation that was implemented to explore the possibility of success of a new social skills model in the public school setting. The design of the study addressed all of these issues: the role of gender; assignment of multiple peer trainers to target students using compatibility matching; selection of peer trainers using specific criteria; accurate fidelity of treatment measures, and; inclusion of social validity measures.

Statement of Purpose

The purpose of this study was to examine the effects of a peer-mediated social skills intervention conducted in in a public school elementary setting on the social interactions of high-functioning students with ASD. The model of PMII was selected for the social skills intervention across two elementary settings within a large suburban school district in the northwestern U.S.

The summative approach after the completion of the intervention assessed outcomes for both the target students and peer trainers by considering four research questions: What is the effect of social skills mediation by trained peers on the frequency of social interactions of the elementary students with high-functioning autism? What is the effect of social skills mediation by trained peers on the quality of social interactions of the elementary students with high-functioning autism? How does compatibility between the target student and peer-trainer further vary the frequency of the social

interactions of the students with high-functioning autism? How does the training and experience in the study affect the quality of empathy in the peer trainers?

Table 7

Overview of Peer Mediation Interventions

STUDY	PURPOSE	PARTICIPANTS	VARIABLES	FOI/IOA/ RELIABILITY	RESULTS
Harper, Symon, and Frea (2008)	Examined use of Pivotal Response Training in peer-led social skill interactions with children ASD in inclusive settings	-Two third-grade target students with HFA -Four girls and two boys, 8-9 yr.-olds as peer trainers	INDEPENDENT Peers used PRT to initiate, narrate play, turn-take, and reinforce DEPENDENT # of initiations required before joining play; # of turn-taking exchanges (dependent variables differed per target's needs and abilities)	FOI: Mean 97% (Range = 78-100) INTER-RATER RELIABILITY: Mean of 88% (Range = 83-100) between two target students	Participants improved social contact with typical peers, social play was doubled. Social contact generalized, as well
Hundert, Rowe, and Harrison (2014)	Examined generalized effects of social script training on students with autism	-Three target students in kindergarten with HFA -One peer buddy assigned to each target student	INDEPENDENT Peer buddies used the social script to facilitate targets' interactions DEPENDENT Social interaction initiations	FOI: 98.4% when social scripts were used alone/ 94.2% when socials scripts were combined with peer buddies INTER-RATER RELIABILITY: Mean of 93% (Range = 80-100) among three TS	Social script training increased social interaction but no generalizing. Addition of peer buddies with social script training resulted in generalizing to new setting

Koegel, Vernon, Koegel, Koegel, and Paullin (2012)	Activities identified as of interest to the target students and their typical peers were included in social clubs twice weekly during regular lunchtime periods.	-One 3rd grader, one 5th grader, and one 6th grader target students - Typically developing peers arranged in social clubs that ate first and then played together for 30 minute recess	INDEPENDENT Details of each structured social club activity were created using a preferred interest of each target student as the theme DEPENDENT Unprompted initiations, social engagement	FOI: Trained adult social facilitators specifically arranged the social club activities as they were trained to do, as indicated by the researcher INTER-RATER RELIABILITY: Average IRR of Engagement with Peers was 99% (range 94%–100%), and the average IRR for unprompted Initiations was 95% (range 82%–100%)	All three targeted children increased their number of unprompted verbal initiations, as well as social engagement with peers, at the start of intervention.
Mason, Kamps, Turcotte, Cox, Feldmiller and Miller (2014)	To examine change in target students' interaction after school staff trained peers to facilitate interaction among target students	-One 3rd grader with HFA; one 2nd grader with HFA, and; one impacted 2nd grader in self-contained class -Six typically developing peers from the target students' classrooms.	INDEPENDENT Facilitated peer social modeling for target students DEPENDENT Number of communicative acts by target student toward peer models	FOI: Mean score of 94% (Range =80-100) IOA: Mean score of 85% (Range =82-90) among three target students	All participants Showed immediate increase in number of interactions as soon as intervention was introduced
McFadden Kamps, and Heitzman-Powell (2014)	Evaluated effect of peer network on verbal interactions on target students with ASD at recess	-Four male target students, 5-8 yrs. old -Four trained peers, 5-6 yrs. old who had received the Peer Network Intervention (PNRI) training	INDEPENDENT Peers utilized PRT to prompt socialization DEPENDENT Unprompted responses and initiations by target students	FOI: Mean score of 89%. (Range of 73-100%) IOA: Mean score of 83% (Range of 65-100%)	Increase in response rate as well as initiations by target students

Owen-DeSchryver, Carr, Cale, and Blakeley Smith (2008)	Examined impact of peer training on social interactions at lunch and recess, and searched for optimal peer trainer selections	-Three target students: two 2nd graders and one 4th grader in inclusive setting -Peer buddies: two to four typical peers assigned to each target student	INDEPENDENT Peer buddy interact with and request target students to play DEPENDENT # social initiations directed to peers and # of responses to peer social initiations	FOI: None reported INTER-RATER RELIABILITY: Mean score of 83% per peer initiations, and 87% for trained peer responses	-Targets showed increase in peer interactions, initiations. and generalization -Untrained peers also increased in their initiations (halo effect)

Chapter 5: Method

This chapter describes the research methodology, procedures, design, and analysis involved in conducting a peer-mediated social skills instruction and intervention in a suburban public school district.

Research Design Overview

A mixed method design was used for the study, integrating qualitative and quantitative research strategies. Qualitative assessments were folded into the quantitative design in order to better inform the quantitative results and to enhance construct validity (Creswell & Plano Clark, 2011). Sequential embedding of the qualitative surveys assisted in interpretation of the study's results (Creswell & Plano Clark, 2011; Johnson, Onwuegbuzie, & Turner, 2007).

This study was designed to focus on the impact of peer-mediated instruction and intervention (PMII) on the social communication and interaction behaviors of four elementary school students identified with HFA. The following research questions were examined in this study:

RQ1: What is the effect of social skills mediation by trained peers on the *frequency* of social interactions of elementary students with HFA?

RQ2: What is the effect of social skills mediation by trained peers on the *quality* of social interactions of elementary students with HFA?

RQ3: How does compatibility between the target student and peer trainer further vary the frequency of social interactions of students with HFA?

RQ4: How does the training and experience in the study affect the quality of empathy in the peer trainers?

IRB Approval

Permission to conduct this study was granted by the Institutional Review Board (IRB) of Johns Hopkins University. Approval was contingent upon permission received from a suburban school district in northwestern Oregon that was associated with the elementary school sites in which the study was conducted. After approval from both entities, the selection of participants and training of peer trainers commenced.

It should be noted that the student researcher and principal investigator were required to complete training from the Collaborative Institutional Training Initiative (CITI Training) in Social and Behavioral Research. Persons participating in the research who did not have any contact with human participants or identifiable data were not required to take this training. This included the observers and coders who took data on their worksheets from a distance and did not interact with, or identify, any of the students. Each student and peer group was identifiable only by a coded number.

Participants

Target students. Six target students were invited to participate across two elementary school sites. Each eligible target student was selected based on the following inclusionary criteria: (a) enrolled in either the 4th or 5th grade in general education, yet struggled with social communication and interaction; (b) met Special Education eligibility of ASD; (c) received social skills training during pull-out session once a week; (d) did not participate in private social skills programs of any kind; (e) had a cognitive assessment score of 85 or greater; (f) had received a social skills rating score by a teacher that was within the Elevated to Clinically Elevated range on the Autism Spectrum Rating Scales (ASRS); and, (g) had been assessed by a Speech-Language

Pathologist and deemed to function within the average range in expressive language ability on the Clinical Evaluation of Language Fundamentals-Fifth Edition (CELF-5). Research has indicated that although students with HFA often score relatively low on the pragmatics and receptive language sections, their expressive language is typically average (Charman, Drew, Baird, & Baird, 2003; Smith, Mirenda, & Zaidman-Zait, 2007).

Out of the six students recruited for the study, four students were selected as target students to receive the intervention due to their close alignment with the criteria. The remaining two students were retained as substitutes in case of attrition of any of the four selected students. See Table 8 for information on the selected target students.

Table 8

Descriptive Information of Target Students

Category	TS1	TS2	TS3	TS4
Age	10	10	10	9
Gender	F	M	M	F
Ethnicity	Asian	White	Asian	White
Grade	4	4	4	4
Full-Scale IQ	Ave	Ave	Ave	Ave
ASRS	Clin Elev	Clin Elev	Clin Elev	Elev
CELF-5 (Expressive)	Ave	Ave	Ave	Ave

The four target students were selected from four different fourth-grade classrooms within two elementary schools in the district. Target Student 1 was a 10-year-old female, as were all three of her Peer Trainers. She was a very quiet and studious

girl who, before the intervention, typically walked around on the playground by herself except for occasionally asking recess duty adults about weather concerns (e.g., "What if it rains while we are out here?", "Do we come out here if it snows tomorrow?", etc.). Her teacher reported that she was academically on track and accelerated in some subjects, but did not interact in class, even on group collaboration projects.

Target Student 2 was a 10-year-old male, and all of his Peer Trainers were also males. His teacher described him as a strong student who was also talented in music and enjoyed watching sports. He was observed to experience difficulty in collaborative academic activities in the classroom, and often kept to himself with his coat hood over his head throughout class. TS2 did appear to enjoy wall-ball on the playground (the only activity he was observed playing at recess this year); however, he was not observed interacting with any of the other players, except to move through the line.

Target Student 3 was a 10-year-old male and his Peer Trainers 2 and 3 were also males. Peer Trainer 1 was a female. TS3 had been successful academically until halfway through this year, when he appeared to become more easily distracted and somewhat compulsive (e.g., he began walking only on certain colored linoleum tiles in the hall and lunchroom, in spite of the fact that he was running into people). His parents reported that he had a future appointment with his doctor to discuss these concerns. In the classroom, TS3 made an effort to avoid social interactions but could be prompted by his teacher to collaborate with certain students during academic activities. At recess, TS3 appeared to use the time to self-regulate after working hard in the classroom, as he followed a daily ritual of walking in wide circles in a certain covered area of the playground and asked those who joined him to leave him alone, explaining, "I need to

be alone at recess." Similarly, when entering the lunchroom, TS3 typically waited and watched where other students sat before finding a place at a table alone, presumably, so he could avoid interacting socially.

Target Student 4 was a nine-year-old female, as were her Peer Trainers 1 and 2. Peer Trainer 3 was a male. Each observed recess prior to the intervention phase, TS4 immediately ran to the swings on the playground so that she could sit in her favorite swing. TS4 would typically swing the entire recess period, except for occasionally walking the perimeter of the grounds alone. When students asked her to give them a turn on the swings she would become anxious and tell them, "I can't. This is my swing." Although TS4 interacted minimally when paired with peers in academic situations, she was not observed playing or interacting with others for pleasure.

Peer trainers. A total of 18 typically developing peer trainers were originally recruited across the school sites. Recruited peer trainer students were selected from a pool of 4th and 5th graders in general education at the same school site as the target student participants. They were then nominated by a teacher, a counselor, and/or the school principal based on a social skills and leadership rubric, and had passed an interview with the student investigator. The eligibility criteria outlined in the leadership rubric included: (a) strong leadership skills, (b) regular school attendance, (c) regular demonstration of empathy and tolerance, (d) demonstration of a high degree of social reciprocity with peers, and (e) demonstration of high academic effort.

Due to the length of the study and the required participation of two recesses a week for ten weeks, only fourteen students were willing to sign assent. Thus, fourteen peer trainers were eventually selected for the intervention, and two served as substitutes

in the case of attrition in any of the originally selected peer trainers. Descriptive information about the peer trainers is provided in Table 9.

Table 9

Descriptive Information of Peer Trainers for Each Target Student

	Target Student 1			Target Student 2			Target Student 3			Target Student 4		
	P1A	P1B	P1C	P2A	P2B	P2C	P3A	P3B	P3C	P4A	P4B	P4C
Age	10	10	9	10	10	10	9	10	10	10	10	10
Gender	F	F	F	M	M	M	F	M	M	F	M	F
Ethnicity	W	W	H	W	H	W	B	A	W	W	W	A
Grade	4	4	4	4	4	4	4	4	4	4	4	4

Note: A = Asian, B = Black or African American, H = Hispanic, W = White

Observers. Overall, five volunteers served as direct observation coders and monitors of implementation fidelity during the study, in addition to the student investigator. Observer One had been trained and certified as a school psychologist and practiced in the school setting in another district for several years before taking early retirement. A second volunteer had recently completed her Speech-Language Pathology coursework and was accruing direct service hours for state certification; part of her university training had included observation of students' social skills and extensive work with students with ASD. A third volunteer had experience working as a Speech-Language Pathologist Assistant and was accruing hours as she worked toward certification and licensure. She also served as a part-time assistant in a school district's self-contained social communication classroom with a majority of students diagnosed with ASD. Two additional volunteers had degrees and certification in Special Education, as well as over 20 years of experience of teaching and observations before recent

retirement. Each observer received a gift certificate for her assistance.

Other key stakeholders. This study included the support of parents and recess duty staff. Both the parents and the recess duty staff served as respondents on target students' behavior checklists that documented changes over the length of the study. The recess duty staff members in School 1, and two others in School 2, were also full-time employees (counselors or teachers) with recess duty as a part of their daily assignment. These recess duty staff members were identified prior to the start of the study when they agreed to participate (see Table 10).

Table 10

Description of Participating Recess Duty Teachers

Participant	Content Area	Years of Experience	Gender	Ethnicity
School 1	Counselor	25+	F	White
School 2	Teacher A	10+	M	White
	Teacher B	10+	F	White

Setting

The intervention was conducted within two elementary sites in a northwestern suburban school district during regular recess sessions. The selection of the two schools was based on similarities in demographics and the presence of both males and females with high-functioning autism in each site. The 2016-17 school district demographics report cited a total of 40,806 students in the district. The demographics of the two schools in which the interventions occurred were almost identical in size as School One had 217 students and School Two had 216 students. Although the two schools differed in percent of students receiving free and reduced lunches, neither of the elementary

schools was considered to be a *priority school* (priority schools are high poverty schools that have been ranked in the bottom 5% of Title IA schools in the state, based on Oregon's rating formula). Thirteen percent of the students in School One were on Individual Education Plans (IEPs), whereas, 14 percent of the students were on IEPs in School Two. Forty percent of students in School One were non-white, and 50% in School Two were non-white (see Table 11 for demographics).

Table 11

2016-2017 School Demographics for District

School	Enrollment	Free/Reduced Meals %	% on IEP	% Student Ethnicity					
				A	B	N	H	W	M
DISTRICT	40,806	37	13	15	3	23	2	50	7
SCHOOL 1	217	12	13	14	3	1	14	60	8
SCHOOL 2	216	44	14	14	2	1	23	50	10

Note: A = Asian, B = Black or African American, N = Native American, H = Hispanic, W = White, M = Multi

Variables and Instrumentation

Independent variable. The independent variable for this peer-mediated social skills intervention was the delivery of the facilitation behaviors by the peer trainers to the target students. These behaviors included initiations, responses, invitations, and modeling, all of which the peer trainers received through direct instruction during the six hours of training.

The source of the curriculum for the peer trainers who instructed them in the delivery of the treatment was based on *Teaching Typical Children to Enhance the Play and Social Skills of their Friends with Autism and Other PDDs: A Manual* (Pierce & Schreibman, 2007). This curriculum contained lesson plans for typically developing peer trainers that included: (a) modeling appropriate social interactions, (b) providing

positive reinforcement, (c) initiating conversations, (d) responding to initiations, and (e) joining others in play (see Appendix L). The lessons covered aspects of reading and interpreting social cues, sharing ideas with others, reciprocal exchanges within conversation, feelings and emotions, self-regulation, and facilitation of the training. Problem solving strategies were also discussed at the end of the last training session.

Dependent variables. Direct observations were used to measure social interaction and engagement outcomes. Social responsiveness checklists were administered to recess duty staff and parents of the target students before, during, and after the intervention in order to measure their perceptions of observed change in social skills over the timeline of the study. Fidelity of implementation and inter-observer agreement among observers lent credibility to the results.

The Target Skills Data Worksheet was developed by the student investigator as a direct observation tool, based on the target skill design suggested by Collins (2012) for observation of more than one behavior (Appendix E). This worksheet was utilized to collect data on the target students during the recess intervention. The dependent variables that were measured in each of the target students were operationally defined in the specific method by which they were examined in the study (see Appendix F).

Social eye contact. The frequency of each of the target students' establishment of eye contact with a peer was measured by observation of the following: (a) direction of the student's face toward a peer, and/or (b) at least two seconds of continuous eye contact. Frequency was measured and reported for each of the two attributes as the number of counted observations. Eye contact could be peer-prompted or independent.

Social verbal response. The frequency of each of the target students' social responses was measured by observation of the following: (a) making eye contact when name was called (as defined under *social eye contact*, above), (b) following directions or a request, (c) answering a question, (d) making a comment, and/or (e) nodding one's head. Frequency was measured and reported for each of the five attributes as the number of counted observations. Verbal response could be peer-prompted or independent.

Social initiation. The frequency of each of the target student's social initiations was measured by observation of the following: (a) greeting another student, (b) asking a student a question (e.g., "Do you want to play?"), (c) making a comment to a student, (d) offering to share a playground item, and (e) saying a peer's name.

Quality of social engagement. The quality of each of the target student's social responses was measured by observation of the following: (a) three or more reciprocal exchanges; (b) walking with, or sitting together with, another student while talking; and (c) engaging in a game or activity for at least two minutes. The observer/coders utilized the technique of Momentary Time Sampling to code the social engagement behaviors every 15-second intervals per their clickers (i.e., forty intervals of 15-seconds in each ten minute observation). At every beep, the observers coded the behaviors occurring at that time which could include one, two, or all three of them.

Peer trainer instruction fidelity checklist. The fidelity implementation instrument that was used as a checklist for the instruction process of peer trainers was developed by the student investigator using the fidelity treatment modules published in Vanderbilt University IRIS Center's (2014) publication, *Implementing a Practice or Program with Fidelity.* The purpose of this tool was to ensure that the instruction

techniques and content of the sessions for the peer trainers adhered to the intended implementation procedures and components, were presented for the intended duration, and were delivered with all quality elements (see Appendix G). According to recommendations in The IRIS (2014) publication, fidelity needs to be met with a score of at least 80%.

Peer trainer fidelity checklist. The fidelity implementation checklist that was utilized to assess the peer trainers was also developed by the student investigator according to suggestions by Strain (1987). The acceptable fidelity score of this instrument was established as 80%, according to the recommendations in the fidelity treatment modules of Vanderbilt University's IRIS (2014) publication, *Implementing a Practice or Program with Fidelity*. The purpose of this instrument was to ensure that the peer trainers adhered to the instruction they received and utilized the strategies they were explicitly taught during their training sessions (see Appendix H). With careful documentation of the delivery of intervention, it was possible to perform component analyses of the program (Strain, 1987).

Direct observation training. The student investigator and three coders observed and coded direct observational sessions during baseline, prior to the intervention. All data collectors (even substitutes) practiced coding target social interaction and social engagement behaviors, as well as peer initiation strategies using videos of typically developing students at recess. Training continued until data collectors obtained an inter-observer agreement level of 90% or higher for four consecutive observations. Data recorded by the student investigator and Observer One were found to be in agreement 99% of the time, and thus, all other observers were trained with one of them until their

coding was found to be in agreement at least 90% of the time. Inter-observer agreement was calculated by weekly comparison of data collected by two observers.

Instruments

Social Responsiveness Scale-Second Edition (SR2). The Social Responsiveness Scale-Second Edition-SRS2 (Constantino & Gruber, 2012) was administered to the recess duty teachers and target student parents before, midway through, and after the intervention phase was completed to examine any changes in the respondents' observations of the target students' social interactions over the timeline of the study. The SRS-2 is a standardized 65-item Likert scale rating system used to measure the impact of social deficits associated with ASD. The norming process was conducted on a sample of more than 2,025 school-age children and separated by identity of rater (parent or teacher) and gender of the child who was rated in the following areas: (a) social awareness, (b) social cognition, (c) social communication, (d) social motivation, and (e) restricted interests and repetitive behaviors of autism.

According to Constantino and Gruber (2012), research analyses indicate that this instrument's overall predictive validity is associated with a sensitivity value of .90, suggesting that the scale identifies 90% of those affected with ASD, and specificity value of .92, indicating that 92% of individuals not affected will not be identified by the SRS-2 as affected. On the School Age Form, moderate to high correlations were found between other rating scales of social behavior and communication. Construct validity was assessed through factor analysis and found to be a good fit for the two-factor model, including the social communication, interaction domain, and the restricted interests and repetitive behavior domain of ASD. Strong internal consistency of .95 was found across

gender and age and across clinical subgroups within the clinical sample. Inter-rater reliability data were collected for all four rating forms. According to Constantino and Gruber (2012), these are adequate correlations considering raters observed the examinees in different environments.

The students in this particular intervention were fourth graders who were either nine or ten-years old. Table 12 lists the measure of internal consistency, or Cronbach's Alpha, for this specific age group by respondent.

Table 12

Cronbach's Alpha for SRS-2 for 9 and 10 year-olds

Age	Parent Report	Teacher Report
9 years old	α = .96	α = .97
10 years old	α = .95	α = .92

The treatment subscales of social awareness, social cognition, and social communication align with characteristics of ASD per the Diagnostic Statistical Manual-Fifth Edition (DSM). Thus, the results of administration of this instrument to parents and the recess teachers provided social validity.

Student Questionnaire on Feelings. The instrument that was utilized as a measure of change in empathy level in the peer trainers during the study was created by the student investigator based on several questions from the *Empathy Questionnaire* or *EmQue-CA* designed by Rieffe, Ketelaar, and Wiefferink (*2010*). The purpose of the newly created 20 item self-report survey, *Student Questionnaire on Feelings,* was to examine the level of empathy reported by the peer trainers before and after the training and intervention (Appendix J). Each peer trainer completed the questionnaire before the initial training and then again six weeks after the intervention was completed.

Student Interest Survey. To collect data on the effect of matching peer trainers with target students according to compatibility, all participants completed the *Student Interest Survey*, which was created by the student investigator (Appendix I). The dependent variable of perceived compatibility and the negative or positive effect of the matching of the peer trainers with the target students was measured by administration of the *Follow-up of Effectiveness of the Student Interest Survey* (Appendix K) to the peer trainers after completion of the intervention phase. This survey can be considered a consumer evaluation instrument as it allowed the peer trainers to list ways in which they perceived the intervention to be of value to themselves, as well as to the target students (Hanley, 2010).

Design

The intervention was conducted using a multiple-baseline design. Multiple-baseline design is a form of single-subject research design; thus, the purpose of the design is to "document causal relationships between independent and dependent variables" (Horner et al., 2005, p.166). Single-case design is considered to be an experimental methodology of rigor that is relevant to special education studies due to its ability to target low-incidence populations such as autism (Horner et al., 2005). Each participant in this design served as the control for their treatment, and graphs of the intervention provided a visual demonstration of their responses to treatment across conditions (Horner et al., 2005; Kazdin, 2011). In each of the two sites, there were two target students and six peer trainers participating in the intervention.

According to Horner et al. (2005), the replication of effects in a multiple-baseline design across different participants, conditions, and different measures of the dependent

variable can increase external and internal validity. Because treatment is staggered at different times for groups of participants or individuals, it can be concluded that changes in behavior (dependent variables) are due to the treatment rather than to chance (Christ, 2007). By gathering data from participants' responses to treatment (the dependent variables), inferences could be made about the likeliness of generalization of the measured response to a greater population (Christ, 2007).

Procedure

The timeline of the plan of implementation of the peer-mediated social skills instruction and intervention is outlined in Appendix M.

Recruitment. Potential target students were selected from the two elementary schools using the inclusionary criteria previously described. The autism consultant assigned to each of the two schools (and who also worked individually with all students with HFA in those respective schools) conducted a special education file review with the student investigator to ensure that all criteria were met. In the fall of the 2016-2017 school year, a team consisting of the principal, counselor, IEP service providers, and autism consultant at each school site were contacted directly by the student investigator to schedule a time to meet and discuss the study. The criteria for the target students were discussed with the team at each school and six students were selected as potential target students. The families of those students were informed of the study and received consent forms to sign and return (see Appendix D). At that time, four target students were randomly selected from the six to participate in the study.

In November and December, 2016, potential peer trainers were nominated from the fourth grade classrooms in which the target students were placed based on a rubric

and selection process suggested by Sperry et al. (2010). Fourteen students were invited to participate as peer trainers, and their parents were contacted to provide information on the study, as well as to answer any questions, issues, or concerns (Table 13). After consent forms were returned, 12 students were selected as peer trainers (see Appendix D).

Table 13

Peer Trainers' Nomination Process

Step	Process
Step 1	General education teachers, principals, and school counselors nominate students to serve as peer trainers based on the leadership rubric*
Step 2	Eighteen nominated students were interviewed by the student investigator
Step 3	Assent was obtained from fourteen peers selected by the student investigator who expressed a willingness to participate in the research project.
Step 4	Twelve students were selected as peer trainers and two were initially considered understudies in case of attrition.

Note. Rubric: (a) strong leadership skills, (b) regular school attendance, (c) consistent demonstration of empathy and tolerance, (d) demonstration of a high degree of social reciprocity with peers, and (e) demonstration of high academic effort.

The student investigator contacted the principals of both schools during December, 2016, to obtain their permission, as well as the names of the certified teachers on staff who served on recess duty. Those teachers were contacted to meet with the student investigator and discuss the study and their potential role in completing a social skills checklist before, midway, and after the study based on their observations. If in agreement, they received a consent form to complete and sign (see Appendix D). At School 1, the counselor served as the recess duty staff for $4^{th}/5^{th}$ grade recess. At School 2, both 4^{th} grade teachers served as recess duty staff for $4^{th}/5^{th}$ recess duty.

Fidelity monitors' training. In the first two weeks of January, 2017, the observer/coders were trained to monitor fidelity implementation of the trainer during the

instruction of the peer trainers using the checklist in Appendix G. Two observers then specifically monitored fidelity of implementation in the student investigator who provided the peer training before the intervention.

All coders observed demonstration and modeling by the student investigator and an autism consultant using the peer trainer fidelity checklist (Appendix H). Both sets of observers received instruction on utilization of the checklists and then practiced coding the sessions together until they all reached an agreement of at least 90%.

Coders' training. Four coders were trained to observe the target students and record data on the Target Students Skills Data Worksheet (see Appendix E). The student investigator and three district specialists familiarized the coders with the data collection form, and then further instructed them how to code the skills as they practiced coding typically developing students at recess. Each coder reached an intra-observer agreement level of at least 85% or higher on two consecutive recess observations to be considered appropriately trained.

Instruction of the peer trainers. The observer/coders were first trained to monitor fidelity implementation of the student investigator as she instructed the peer trainers using the checklist in Appendix G. Two observers then specifically monitored fidelity of implementation in the student investigator as she trained the peers during the baseline phase of the study.

The twelve selected peer trainers and two substitutes attended four 1.5-hour training sessions at their respective elementary schools during the baseline phase of the study in the beginning of January, 2017. Instruction by the student investigator, and one district autism consultant with several specialists, utilized the peer trainer curriculum

based on *Teaching Typical Children to Enhance the Play and Social Skills of their Friends with Autism and Other PDDs: A Manual* (Pierce & Schreibman, 2007). In each session, 45 minutes were spent on explicit instruction and video examples. The peer trainers began their first instruction session by watching two PowerPoint presentations, *We Are All Different* and *How to Be a Buddy*, which both presented an overview of the differences in students with social communication challenges, as well as their learning strengths and limitations (see Appendix L). During subsequent sessions, the peer trainers received explicit training in initiating, responding, inviting, and modeling appropriate social behaviors (see Appendix F). During the practice and role play sessions, peer trainers were coached by the student investigator as visual cue cards were introduced (see Appendix L). These cards were used nonverbally during the actual intervention phase to cue trainers when to prompt target students.

Each session was followed by a short break and then the students were divided into groups with adult leaders. Each group utilized the remaining 30 minutes to rehearse and role-play the lessons of the day, followed by review of videos of them role-playing that day, feedback from instructors, and a question and answer session. Treatment integrity was collected during all of the sessions by two of the observer/coders as they recorded data on the fidelity implementation worksheet (see Appendix D) by circling a *zero* if the element of the training did not occur, and a *one* if the element did occur. The treatment integrity for all four sessions was 100%.

Administration of questionnaires and checklists. One of the potential benefits of being a peer trainer is an increase in tolerance and empathy for those with disabilities (Carter et al., 2005). To collect data on changes in levels of empathy before and after the

intervention, the peer trainers completed the *Student Questionnaire on Feelings* immediately before attending the Peer Training Instruction. The results were scored before the intervention commenced. Five weeks after the intervention was completed, the peer trainers once again completed the same questionnaire, and the pre- and post-study scores were analyzed for differences.

A literature review of several peer-mediation social skill studies revealed that researchers considered lack of compatibility between peer trainers and target students to be limitations and an area to be further investigated (Chan et al., 2009; Harper et al., 2008; McFadden et al., 2014; Owen-DeSchryver et al., 2008). In order to collect data on the effect of matching peer trainers with target students according to compatibility, all participants completed *The Student Interest Survey* before the intervention began. The process of matching each target student with three of the most compatible peer trainers was based on the results of these questionnaires.

Social validity is a construct that measures the extent to which stakeholders perceive that an intervention is acceptable and results in meaningful change in target behaviors (Kazdin, 2011). In order to address social validity, recess duty staff and parents of target students were administered a social responsiveness checklist to rate target students throughout the phases of the intervention Parents of the target students completed the parent form of the *Social Responsiveness Scale, Second Edition-SRS 2* (Constantino & Gruber, 2005) before, midway, through and after the intervention. Recess duty teachers were administered the teacher form of the checklist on the same schedule.

Evaluation of consumers' perceived meaningful involvement in a study can

provide not only satisfaction to those consumers but also more validity to an intervention (Hurley, 2012). Another tool that assessed social validity related to consumer evaluation was administered to the peer trainers after intervention. The *Follow-Up on Effectiveness of the Student Interest Survey* asked the peer trainers to rate how effective they felt they were in affecting positive changes in those target students with whom they facilitated social interaction. This instrument contained seven questions in a Likert scale rating system about the compatibility matching process. Two fill-in-the-blank open-ended questions allowed the peer trainers to reflect on their perceptions of personal impact in the study.

It should be noted that confidentiality was discussed in length and highly emphasized during the peer trainer sessions. Along that line, none of the peer trainer triads were told who their target student would be until the first day of the intervention. In this way, the peer trainers were not able to discuss their target students or come to any premature conclusions about the targets' needs or behaviors until the first intervention session began.

Intervention and Data Collection

After the instruction of the peer trainers and administration of the pre-tests, the intervention began at each of the two schools with the intervention. The multiple-baseline design was composed of three distinct phases: baseline, intervention, and generalization. and generalization probes. The first student at School One began baseline phase alone, and only when that first student moved into the intervention phase, joined by the three assigned peer trainers, did the second student at that site move into baseline phase. The second student remained in baseline phase until the first student's trend line

in intervention was established, at which time the second student moved into the intervention phase, joined by his/her three assigned peer trainers. The same pattern was followed in School Two.

During the *baseline* phase, coders observed the target students at each school during four to six recesses (two times per week) using the target skill data. The baseline phase continued until stability was reached in the target behaviors. A minimum of three baseline data points are required to establish dependent measure stability, however, more are preferable (Kazdin, 2011). In this study, five to six baseline data points were collected. There was no participation of the peer trainers during this phase.

After a stable baseline had been established, the first student entered an *intervention* phase. This phase consisted of two observed recesses per week for 10 weeks during which the three assigned peer trainers joined the target student and shared the explicit social strategies they had learned. After a positive trend line was visually determined among data collected during the initial three weeks of intervention for the first student, the second student at each school entered intervention, assuming that baseline data had reached stability. This progression occurred in both school sites and all data was continuously examined for variability, slope, and level as required in this evidence-based practice (Byiers, Reichle, & Symons, 2012).

The student investigator was present during all intervention sessions and prompted and coached the peer trainers in their facilitation during this phase by using visual cue cards as needed for reminders, especially during the first two weeks of intervention as they were gauging how and when to mediate (see Appendix L). A set of coders observed the target students and recorded target skills data using Appendix E. A

different set of observers coded the peer trainers for implementation fidelity in using the strategies imparted to them during training, using the fidelity worksheet in Appendix H one day a week. Those same observers collected data for inter-observer agreement on the other day of each week. On the three days each week in which no observations occurred, the peer trainers did not directly facilitate play with the target students, although they were free to interact verbally with each other. (At the onset of the intervention phase, the peer trainers were instructed to take turns playing with other students on those three days.)

The *generalization phase,* a two-week data collection phase, occurred in the lunchroom, another natural social setting, in order to determine if the social behaviors were generalized by the target students to different classmates and a new setting. Two observations during each of the two weeks began a month after the intervention ended. Observers coded the social interactions of the target students with others using the same target skill data sheet utilized during baseline and intervention, taking two data points per week per student. The facilitation by the peer trainers was not a part of this phase as they were intentionally removed from the lunchroom on those days so that generalization across settings could be determined.

Data Analysis

Several sets of data were analyzed after the intervention was completed including observed frequency of eye contact, verbal responses, social initiations, and overall quality of social engagement. Inter-rater observation agreement and fidelity of implementation by the peer trainers were calculated, as well. Lastly, social validity assessments were scored and qualitative responses to consumer evaluations were

analyzed for common patterns. Please refer to the variable matrix in Table 14.

Inter-observer agreement between the coders' observations of the target students' social interactions was calculated using the coding sheets from every other session (10 in all) in the intervention phase of each target student (i.e., TS1, TS2, TS3, and TS4) and compared for agreement. The observations of the three frequency count behaviors (i.e., eye contact, initiations, and verbal responses), as well as the quality count behaviors taken per time intervals (social engagement), were calculated individually per target student. The IOA of both frequency and quality category were calculated by dividing the number of agreements by the total number of agreements plus disagreements, and then multiplying by 100.

Data collected on fidelity of implementation of the instruction provided to the peer trainers by the student investigator, specialists, and autism consultants during peer training sessions prior to intervention were analyzed and compared with the recommended minimum fidelity score range of 80% (The IRIS Center, 2014). Data collected on fidelity of implementation of the facilitation of social skills by the peer trainers during the intervention phase was also conducted in the same manner.

Coded observational data of the target students' change in social interactions (dependent variable) as a response to peer trainers' facilitation of social skills training (independent variable) during intervention and generalization phases were analyzed visually though the change in each phase as plotted on the multiple baseline graph.

Pre-, mid-, and post- intervention responses to the social responsiveness checklist (*Social Responsiveness Scale, Second Edition-SRS 2*) by the parents of the target students, as well as the recess duty teachers, was analyzed through descriptive statistics

to measure their observations of change in each category of target students' social behavior (dependent variable) over the timeline of the intervention after peer trainer facilitation of social skills training (independent variable).

Pre- and post- responses of the peer trainers on the empathy and feelings self-report were analyzed to measure empathy change (dependent variable) over the process of leadership training and involvement as peer trainers in the study (independent variable).

Responses from the compatibility self-report completed by the target students and peer trainers before the intervention were utilized in matching the two sets of participants in the study. The responses to the post-test given to the peer trainers about how well they felt they were matched were scored. See Appendix M for a summary of the timetable of the implementation of the study.

Summary matrix. Discussion and results of the study will be presented in chapter 6. The alignment between the study's research questions, variables, and data collection procedures is illustrated in the Variable Summary Matrix in Table 14.

Chapter 6: Results and Discussion

Unlike their typical peers, students with HFA learn social skills best through specifically designed instruction, followed by generalization and maintenance in natural settings across time (Koegel et al., 2012). Most people are able to quickly process social cues and interpret people's intentions; however, the social skills deficits that impact many individuals with autism block those abilities (Bauminger et al., 2003). Processing social cues and interpreting the intentions of others is often impaired in these students, and so they tend to rely on one method taught in one situation, and assume it is to be used exclusively, even in different contexts (Williams-White et al.,2007). Due to the inability to focus on social stimuli, those with autism are less able to imitate and re-enact social behaviors, and so require opportunities to generalize what they have practiced in order to transfer learned social skills into natural situations (Klin et al., 2003).

The current social skills delivery model in many districts includes only training and practice in a small group setting with an adult-provider and two to three other students who are working on goals related to similar social deficits. Without the chance to transfer and generalize their learning into real-life situations with typically developing peers (e.g., lunch and recess), the training process is incomplete (Klin et al., 2003). Research findings suggest that, in the absence of multiple opportunities with peers, students with HFA do not generalize those skills they have learned in isolation with an adult to new contexts (Scheeren et al., 2012).

The primary purpose of this study was to examine the effects of a peer-mediated social skills intervention conducted in a public school elementary setting on the social interactions of students with HFA. The study also allowed exploration of the possibility

that such a practice could supplement the current service delivery model of social skills training for this population of students in many public school settings in districts across the country that depend on pull-out models that do not meet all four steps of evidence-based socials skills training that recent research suggests is required for success (Koegel et al., 2012). With this supplemental model, students would not only be taught new social skills and encouraged to rehearse them in a small setting, but would also be provided with opportunities for generalization of those skills in natural settings with typical peers, and staff monitoring for skills maintenance over time (DiSalvo & Oswald, 2002; Kasari et al., 2012; Koegel et al., 2012).

Intervention Research Questions

This chapter presents results of a peer-mediation social skills intervention conducted across two elementary settings within one school district that included four target students, each assigned to a triad of peer trainers. All 16 participants were fourth-graders and their ages ranged from nine to ten-years old. The study aimed to examine the following research questions:

RQ1: What is the effect of social skills mediation by trained peers on the frequency of social eye contact, social verbal response, and initiations of elementary students with HFA?

RQ2: What is the effect of social skills mediation by trained peers on the quality of social engagement of elementary students with HFA?

RQ3: How does compatibility between the target student and peer trainer further vary the frequency of social interactions of students with HFA?

RQ4: How does the training and experience in the study affect the quality of empathy in the peer trainers?

The results of this intervention will be presented by first discussing the procedures that were followed to ensure quality of the results. The results of the study will then be examined according to their relation to the research questions. A discussion of the limitations of the study and possible implications for future practice will follow.

Table 6.1 lists and describes the variables of this study as they relate to each of the four research questions, as well as the data sources for the dependent variables and the frequency protocol of resulting data collection.

Table 14

Variable Summary Matrix

RESEARCH QUESTION	INDEPENDENT VARIABLE	DATA SOURCE ON DEPENDENT VARIABLE	FREQUENCY	RESPONSIBILITY
RQ 1: What is the effect of mediation by trained peers on the *frequency* of social interactions of students with HFA?	A) Peer trainers' facilitation of social skills training through modeling of appropriate social interactions	Recess Observations Inter-observer Agreement Implementation Fidelity of Peer Training Process Peer Trainers' Fidelity of Implementation	-4-6 Baseline Observations -10 Intervention weeks (2xWk) -4 Generalization Observations	Student Investigator and Observer/Coders
	B) Perceived social responsiveness in Target Student via ratings by Parents and Recess Duty Staff	*-SRS-2nd Edition Teacher Checklist/ Parent Checklist**	Pre-, Midway, and Post-Intervention	

RQ 2: What is the effect of mediation by trained peers on *quality* of social interactions of students with HFA?	A) Peer trainers' facilitation of social skills training through modeling of appropriate social interactions	Recess Observations Inter-observer Agreement Implementation Fidelity of Peer Training Process Peer Trainers' Fidelity of Implementation	-4-6 Baseline Observations -10 Intervention weeks (2xWk) -4 Generalization Observations	Student Investigator and Observer/Coders
	B) Perceived social responsiveness in Target Student via ratings by Parents and Recess Duty Staff	*-SRS-2nd Edition Teacher Checklist/ Parent Checklist**	Pre-, Midway, and Post-Intervention	
RQ 3: How does compatibility between target student and peer trainer further vary frequency of social interactions of the students with HFA?	Compatibility Survey for both target students and peer trainers	*Student Interest Survey*	Survey completed by both target students and peer trainers before intervention	Student Investigator
		Follow-up on Effectiveness of Student Interest Survey (on Compatibility)	Follow-up survey completed by peer trainers	
RQ 4: How does training and experience in the study affect quality of empathy in the peer trainers?	Empathy Self-Survey for Peer Trainers	*Student Questionnaire on Feelings* *Pre-and Post-intervention administration*	Pre- and Post-intervention survey for Peer Trainers	Student Investigator

Procedures to Ensure Quality

Before examining results of the intervention, it is important to ensure that procedures were put into place that will lend credibility to the findings. Implementation of an intervention requires methodological strategies to enhance validity and reliability that are integral to interpreting and generalizing findings (Cooper, 1982). These safeguards can reduce the human element of error in both the procedural implementation of the intervention as well as in the measurement of the behaviors observed during that intervention. Two vital procedural tools that promote confidence in results are fidelity of implementation and inter-observer agreement.

Inter-observer agreement. Inter-observer agreement (IOA) is the degree to which two or more independent observers report the same observed values after measuring the same events (Watkins & Pacheco, 2000). IOA is an essential tool to determine the competence of the observers, to detect observer drift, to assess whether the target behavior is clear and the system not too difficult to use, and to increase credibility of the data (Cooper, 1982). IOA requires that two or more observers use the same observation code and measurement system, observe and measure the same participants and events, and record the behavior independently without influence by other observers (Cooper, 1982; Watkins & Pacheco, 2000). In this study, the *exact count-per-interval* method of IOA was utilized in calculating a percentage of the total intervals in which two observers recorded the same count.

The coding sheets of two observers at each school were collected for 50% of the interventions sessions of each target student and compared for agreement. The observations of the three frequency count behaviors (i.e., eye contact, initiations, and

verbal responses), as well as the quality count behaviors taken per time intervals (social engagement), were calculated individually per target student. The IOA of both the frequency and quality categories were calculated by dividing the number of agreements by the total number of agreements plus disagreements, and then multiplying by 100 as presented below.

Table 15

Inter-observer agreement (IOA): Percentages of Agreement Among Observations of Target Students by Target Behaviors

Target Behaviors	TS1	TS2	TS3	TS4	Total
Eye Contact	80.0	80.0	87.5	75.0	80.63
Initiations	81.0	90.0	100.0	87.5	89.63
Verbal Responses	90.0	70.0	87.5	87.5	83.75
Social Engagement	100.0	90.0	100.0	100.0	97.50
Total	87.8	82.5	93.8	87.5	87.88

The acceptable level of IOA is that in which agreement between observers is at least 80% (Cooper, 1982). These results indicate that the total IOA for each behavior, as well as for each target student, exceeded that minimum acceptable level. One behavior that resulted in a low percentage of agreement was verbal response in TS2, which could be accounted for by the need for observers to be close to the target student in order to discern response to a conversation partner. However, the protocol for observation required that observers be somewhat distant and apart from the target students in their activities to avoid reactive assessment, making it more difficult for observers to detect nuances in this behavior as TS2 played wall-ball. The other low calculation of agreement was noted in

eye contact of TS4. This target student was often running or swinging as she interacted, which made it difficult for observers to confirm that she was establishing eye contact with a peer trainer.

Fidelity of implementation. Fidelity of implementation (FOI) has been traditionally defined as the determination of how successful "an intervention is implemented in comparison with the original program design during an efficacy and effectiveness study" (O'Donnell, 2008, p. 33). Fidelity assessment allows determination of the extent of construct validity and external validity that, in turn, contribute to generalizability of results. When results are significant, fidelity of implementation makes it possible to describe what exactly did work and to discuss the actual difference between treatment and control (Torres, Farley, & Cook, 2012). When results are not significant, fidelity of implementation may explain some of the reasons why the intervention did not work. Thus, fidelity of implementation can potentially improve understanding of results as well as the need for future implementations (Torres et al., 2012). According to the National Standards Report of the National Autism Center (2009), key components of fidelity of implementation include *adherence* to the procedures as they were intended to be implemented; appropriate *exposure/duration*, which entails implementing the practice for the intended length of session, duration, and frequency, and; *quality of the delivery* of the practice.

Fidelity of instruction of peer trainers. The fidelity implementation instrument that was used as a checklist for the instruction process of peer trainers was developed by the student investigator using the fidelity treatment modules published in Vanderbilt University IRIS Center's (2014) publication, *Implementing a Practice or Program with*

Fidelity. The purpose of this tool was to ensure that the instruction techniques and content of the sessions for the peer trainers adhered to the intended implementation procedures and components, were presented for the intended duration, and were delivered with all quality elements (see Appendix G). According to recommendations in the IRIS (2014) publication, fidelity needs to be met with a score of at least 80%.

Two observers coded the student investigator during each of the four sessions of 1.5 hours of training using the *Fidelity Instruction of Peer Trainers* sheet (Appendix G). The fidelity score was 100% for each of the four sessions with 100% inter-observer agreement between each set of two observers (there were four observers in all who rotated in pairs to score the four sessions).

Fidelity of treatment implementation by peer trainers. Fidelity of implementation observations during the intervention were taken during ten intervention sessions per each peer trainer assigned to a target student. The student investigator and three of the observers rotated as coders for FOI on the days that data was collected, and utilized the peer trainer fidelity sheet in Appendix H. Each observer was required to use an interval count of 2 minutes (5 intervals) per peer trainer, and mark a tally for the occurrence of each behavior in the corresponding rows when the timer went off. The total behaviors observed in each peer trainer are graphed below in the target student cluster for visual representation. In addition to the graphs, discussion of the observations of specific behaviors follows with overall averages noted per session.

As previously mentioned, treatment fidelity is recommended to be met with a benchmark of at least 80% (IRIS, 2014). Data on implementation frequency of the peer trainers was gathered during 50% of the intervention (10 sessions). The student

investigator originally intended to use the average of the observed implementations of each triad of peer trainers to establish FOI benchmark. However, Peer Trainer 2 of Target Student 1 almost dropped out of the study and her implementation during the last few weeks was much lower than the other two peer trainers and would have artificially lowered the benchmark threshold (which will discussed more fully later in this chapter). Thus, her data was omitted from the calculation of Target Student 1's triad and only the data of two of the peer trainers was averaged. The averages of the other three triads were based on all the data of their three peer trainers. The averages of all four groups were combined and divided by 4. That quotient was then multiplied by 80% to establish the FOI benchmark of 13.5 facilitations per session.

The dotted line on each graph represents the 80% fidelity benchmark (13.5 facilitations) , and all Peer Trainers with the exception of Trainer P1B met that mark. Similarly, the same quotient was also multiplied by 90% to reach another reference point (15.6 facilitations) for the average goal of fidelity implementation for each peer trainer. Figures 5-8 provide visual representation of the peer trainers' adherence to facilitation of social skills with their target students.

Peer trainers of Target Student 1, School 1. Two of the peer trainers facilitating social skills with Target Student 1 appear by the graph in Figure 5 to have been more active than the third. Peer trainer 1 (P1A) averaged 15.9 facilitations per session (range, 14 - 17 occurrences) over the ten observed sessions, whereas Peer Trainer 3 (P1C) averaged 18.9 facilitations (range, 17 - 21 occurrences). However, Peer Trainer 2 (P1B) only averaged 12.0 social skills facilitations per session with the target student (range, 9 - 14 instances). Peer Trainer 2 (P1B) was often distracted by other

friends on the playground and required nonverbal prompting (via the cue cards) from the student investigator to focus on working with Target Student 1. As can be observed, 20% of her facilitations, as measured on this graph, did not meet the fidelity benchmark. However, the average facilitations of Peer 1 and Peer 3 met and exceeded the benchmark, as well as the 90% facilitations goal, as noted in Figure 5.

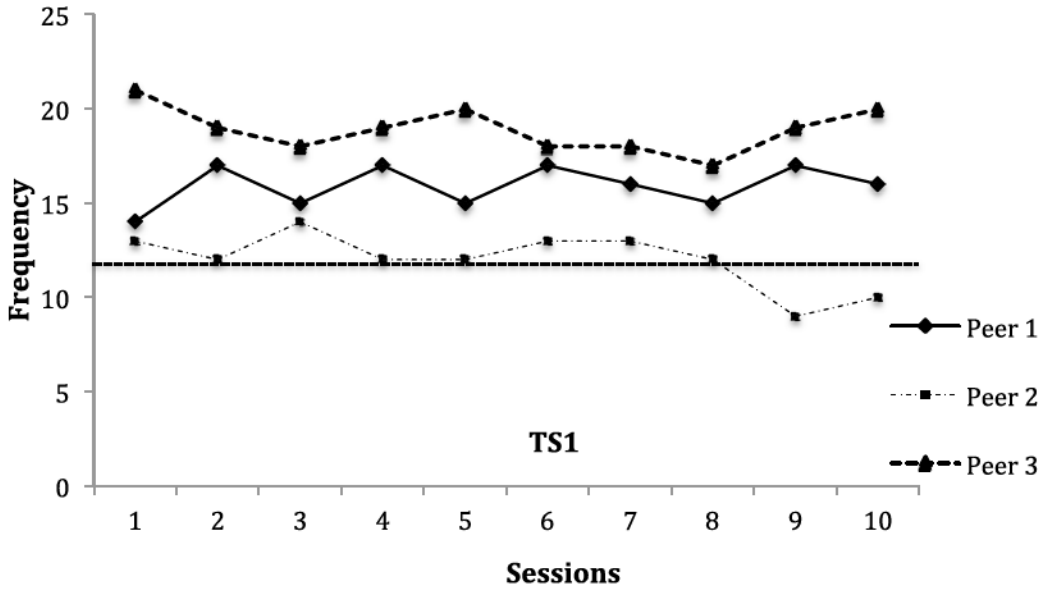

Figure 5. Fidelity of implementation of Target Student 1's peer trainers.

Peer trainers of Target Student 2, School 2. Peer Trainer 1 (P2A) was very attentive to the job of social skills facilitation throughout the ten observed sessions and averaged 17.9 facilitations per session, (range, 15-20 facilitations). Peer Trainer 2 (P2B) also worked closely with Target Student 2 and averaged 17.5 facilitations per session (range, 16–19 occurrences). Peer Trainer 3 (P2C), required some cue card prompting during the first few intervention sessions and averaged 16.6 facilitations overall, (range, 16-20 facilitations). However, Figure 6 visually indicates that Peer Trainer 3 (P2C) soon independently facilitated Target Student 2's social skills, and that throughout most of the

sessions, this peer triad worked together closely. The averages of all three of Target Student 2's peer trainers exceeded the fidelity benchmark, as well as the 90% goal, as noted in Figure 6.

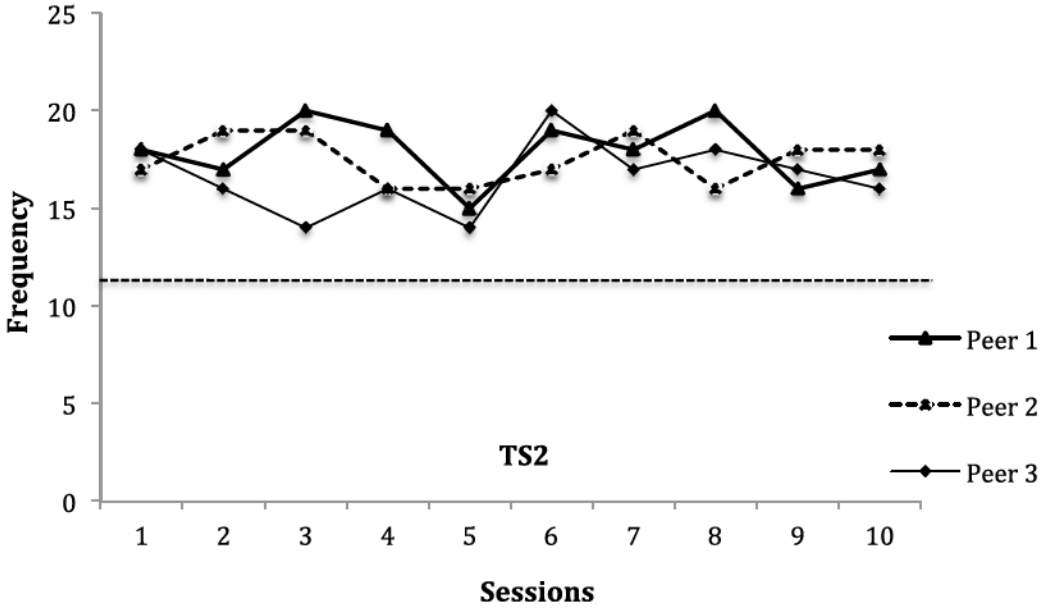

Figure 6. Fidelity of implementation of Target Student 2's peer trainers.

Peer trainers of Target Student 3, School 1. As visually represented in Figure 7, Peer Trainer 1 (P3A) of Target Student 3 was calculated to facilitate a daily average of 19.5 times over the ten observed sessions, (range, 19-22 occurrences). Peer Trainer 2 (P3B) was close behind, facilitating a daily average of 19 times over the sessions (range, 17-19 instances), and the graph indicates that they complemented each other in their patterns of social skills mediation. Peer Trainer 3 (P3C) was somewhat behind them until joining their pattern at around the eighth observed session. Peer Trainer 3 averaged 16 social skill facilitations daily across the ten observed sessions, (range, 14-18 occurrences). The averages of all three of Target Student 3's peer trainers exceeded the fidelity benchmark as well as the 90% goal, as noted below in Figure 7.

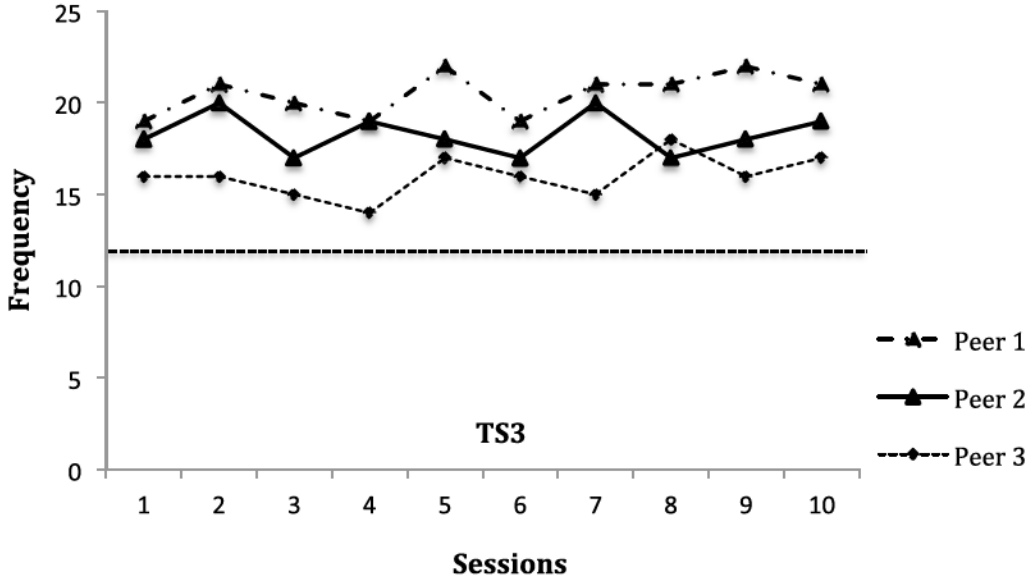

Figure 7. Fidelity of implementation of Target Student 3's peer trainers.

Peer trainers of Target Student 4, School 2. Figure 8 represents the interwoven facilitation of Target Student 4's peer trainers. Peer Trainer 1 (P4A) averaged 17.9 social facilitations per session, (range, 16-20 facilitations). Peer Trainer 2 (P4B) averaged 17.5 daily facilitations, (range, 16-19 occurrences). Peer Trainer 3 (P4C) averaged 16.6 daily facilitations over the ten sessions (range, 16 -20 facilitations) and followed along with Peer Trainer 1 and Peer Trainer 2, who often were more assertive in approaching their peer buddy. Peer Trainer 3 often watched to see the direction of the play before jumping in to facilitate. Yet, the averages of all three of Target Student 4's peer trainers exceeded the fidelity benchmark, as well as the 90% goal, as noted below in Figure 8.

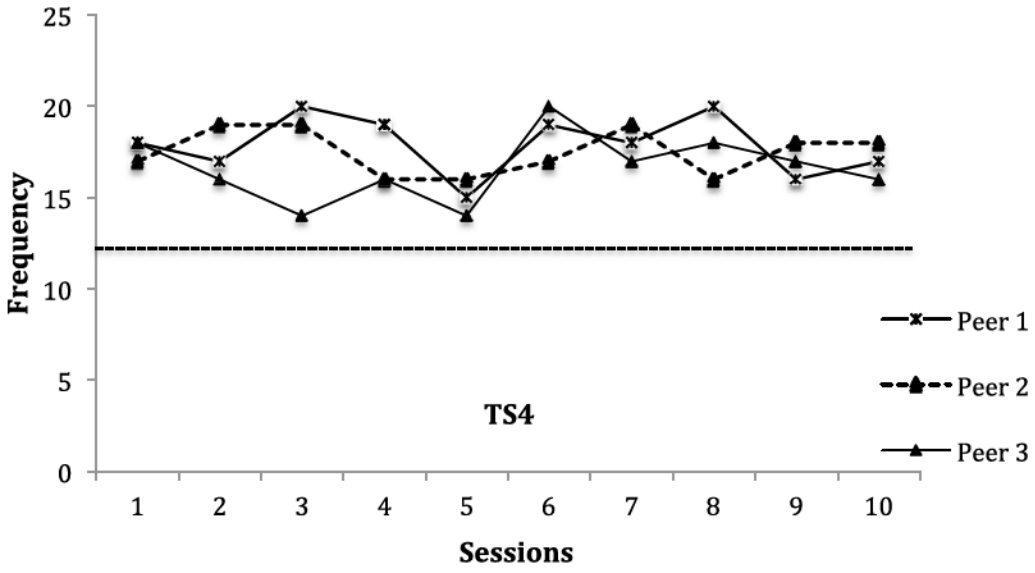

Figure 8. Fidelity of implementation of Target Student 4's peer trainers.

In summary, the 12 peer trainers were observed to be conscientious, overall, in their roles as social skill facilitators. Although some prompting with visual cue cards was necessary during several of the first intervention sessions, all but one peer trainer quickly appeared to be comfortable working with their target students to facilitate eye contact, verbal responses, initiations, and overall social engagement.

All peer trainers, with the exception of Peer Trainer P1B, met the 80% threshold of facilitation, which fell at 13.5 facilitations. The 90% threshold of fidelity of implementation of 15.6 was also met by all of the peer trainers, with the exception of Peer Trainer 2 (P1B) of Target Student 1. This peer trainer did not meet fidelity benchmarks during the last two observed sessions, although Peer Trainer 3 (P1C) appeared to attempt to compensate during those sessions with a high rate of facilitation. The average fidelity of implementation over all ten sessions for each peer trainer met or exceeded 90%, with the exception of Target Student 1's Peer Trainer 2 (P1B).

These visual graphs and discussions suggest that the implementation of fidelity instruments detected adherence to the intended procedures for the duration of the intervention and provided overall quality delivery of the peer-mediated social skills by the peer trainers to the target students. The results of the calculation of inter-observer agreement also suggest competency of the observers, resulting in an increased credibility of the data that will be discussed in the following section.

Results of the Intervention

The Target Skills worksheet (see Appendix E) was developed by the student investigator as a direct observation tool based on the target skill design suggested by Collins (2012) for observation of more than one behavior. This instrument was utilized to collect data on the target students during the intervention. The dependent variables that were measured in each of the target students are operationally defined in the specific method by which they were examined in the study (see Appendix F).

All of the data of the study of the target students were recorded on graphs using multiple baseline design. According to Kazdin (2011), the data on a multiple baseline graph requires analysis according to the following criteria: (1) evidence of a minimum of three data points per each condition (baseline, intervention, generalization probes), (2) only one element of the intervention is changed when moving from one phase to the other, (3) trend direction and the stability of the data points must be analyzed, (4) level change must be analyzed, (5) the latency of change between the onset of each condition must be analyzed, and (6) overlap of data points across phase changes must be analyzed.

During baseline, there were no peer trainers available as they were not informed of the names of their respective target students until the first day of intervention in order

to further protect confidentiality and reduce potential confounding variables due to target students becoming aware of the study. At least five baseline data points were collected on each of the target students and they were noted for their stability of trend and direction. The intervention phase was introduced, which included the three selected and instructed peer trainers per target student. Throughout the intervention phase, peer trainers were cued via visual cards to provide prompts and modeling to target students when needed.

The trend of the intervention data was calculated using the split-middle method. This method requires that the baseline be split in the middle and the mean of each half of the graph used as a point through which to plot a predictor line. If more than 80% of the points in the intervention fell within 15% above or below the line, the intervention could be considered successful (Ottenbacher & Cusick, 1991). This calculation can also be employed in the Excel graphing system, which was the method utilized by the student investigator. All of the graphs in the study met these criteria.

Latency of change can be described as immediate, delayed, or no change. Although some of the target students' social interactions on the graphs indicated that they reacted somewhat slowly to the peer mediation at first, there was never an overlap of data points displayed between the last baseline data point and the first data point of the intervention phases. All of the criteria determinations for the multiple baseline graphs presented in this section were followed in the same manner.

The procedure of data collection at each school proceeded as follows: As soon as each first target student at a school met the criteria for at least five stable baseline data points, that student moved to the intervention phase while the second target student at

that same school moved into baseline. When the first student reached a stable trend and slope, the second student at the school moved into intervention phase. As soon as data for the first student was taken for 20 intervention sessions (two sessions twice a week for ten weeks), the study at that school ceased.

Five weeks later, the target students were observed in the lunchroom two times per two consecutive weeks as generalization probes were taken. Peer trainers were not present during any of those probes, as the purpose of the observations was to examine generalization of any learned social skills in a new setting with new students.

This exact sequence of phases within the intervention was followed in both schools, so that two studies were occurring simultaneously across the district in two elementary schools that were over ten miles apart. While data from school one's study was collected at before-lunch recess (12:15-12:45pm), school two's study occurred at afternoon recess (1:45-2:10pm).

Research Question 1: What is the effect of social skills mediation by trained peers on the frequency of social interactions of students with HFA? The *frequency* of the following social behaviors was documented on the Target Skills worksheet, and data was plotted on the following individual multiple baseline graphs. A visual analysis of each graph of these social interactions will be employed to present data for each school in the figures below. The latency (length of change between baseline and intervention), overlap of data points at the end of baseline and beginning of intervention, level or magnitude of the data points representing response (dependent variable), and the trend of increase and/or decrease of the responses will be discussed as suggested by Kazdin (2011). Average observed social behaviors per session, as well as range over the

study, will also be provided. Sessions extended for ten minutes in all phases. Results will be reported by school as the behaviors of the two students at each site were recorded on one multiple baseline design graph per school. Target Student 1 at School 1 began baseline first, and a day later Target Student 2 entered baseline at School 2. TS3 at School 1 remained in baseline until TS1 demonstrated stability in her social responses during the intervention phase at that site. At that time, TS3 moved into intervention. Similarly, as soon as TS2 at School 2 demonstrated stability in his responses in the intervention phase, TS 4 was met by her peer trainers in intervention.

Social eye contact: The frequency of each of the target students' establishment of eye contact with a peer was measured by observation of the following: (a) direction of the student's face toward a peer; and/or (b) at least two seconds of continuous eye contact. Frequency was measured and reported for each of the two attributes as the number of counted observations per session.

As can be seen in Figure 9, which displays a graph of data collected on target student eye contact at School 1, TS1 did not demonstrate much frequency of social eye contact with peers on the baseline graph (although she did speak to recess staff, at times). Visual analysis indicates a flat line with no trend of change in increasing or decreasing direction. TS1's overall average frequency of observed eye contact during baseline was 2.6 eye contact behaviors per session (range, 2-13 occurrences). The latency of change from baseline to intervention for TS1 was immediate without overlap of data points, but with an increase in level. She continued to demonstrate moderate eye contact, with an overall observed average of 18.0 eye contact behaviors per session (range, 6-38 occurrences) throughout the intervention phase. Visual analysis of

intervention data also reveals variability and oscillations with no pattern until the last third of the phase, during which a slow increasing linear trend began. During the fourth observation in the intervention phase, it started to rain heavily after only five minutes and the students were told to run inside (thus, the lower data point). Session eight also denotes a decrease in data collection, and that was due to TS1 feeling nauseous that day and subsequently going home from school soon after. Other variability in the data reflects different games that TS1 played with her peer trainers. Some required more eye contact than others (a favorite game was "Statues" in which one could not speak or move after being told where to stand and how to pose). During the generalization probes, TS1 immediately interacted with several girls at her lunch table, in spite of the fact that none were her peer trainers. She demonstrated an overall average of 46.0 eye contact behaviors per session (range, 37-51 occurrences) during this phase in the cafeteria. Visual analysis indicates no trend during these generalization probes, although the level of response was still at or above that of most of the intervention data points.

Although TS3 responded to the eye contact of others and usually established eye contact when spoken to, he did not interact socially as will be discussed in the next sections on verbal responses and initiation. During baseline, he demonstrated an overall average of 1.9 eye contacts per ten-minute session, (range, 1-4 occurrences). Visual analysis of baseline on TS3's graph in Figure 9 indicates a flat line with no trend while he talked to himself and kept his head down for most of the time, only occasionally looking up when others ran near him. When his peer trainers joined him on the first session of intervention by dribbling basketballs in his usual spot under the covered playground section, he initially attempted to ignore them and/or move away. But when

they asked him if they might share his space, TS3 returned eye contact and nodded immediately, which is represented visually as immediate latency on the graph and no overlapping data points with baseline. As the intervention phase progressed and he became more comfortable with the peer trainers, he often returned their comments with eye contact. It was during the group's conversations that TS3 modulated his responses with the most eye contact with the peer trainers, demonstrating an overall frequency average of 13.0 observed eye contact behaviors per session, (range 7-20 occurrences). No visual trend pattern is indicated on the graph in Table 9, although the variable level pattern of behaviors during intervention is higher than that of baseline. When TS3 entered the generalization phase, he followed his lunchroom ritual of waiting until all other students were seated to find a place to eat that would allow him to avoid social interaction. His eye contact during the four days of probes in the lunchroom appeared to be for the purpose of looking at those around him who were speaking and he often turned his head, made eye contact, and then turned away quickly so as not to have to converse. Visual analysis of the generalization phase on the graph indicates the same level in entering that phase as the last data point of the intervention. No trend pattern is evident, although the level continues to remain close to that of intervention. TS3 averaged a frequency of 8.8 eye contact behaviors per session over the four days of this phase, (range, 8–10 occurrences), as noted in Figure 9.

In School 2, TS 2 demonstrated a daily average eye contact frequency of 3.6 behaviors, (range, 2-4 occurrences) during baseline, although visual analysis of Figure 10 does not indicate any trend. TS2 immediately established eye contact with peer trainers at recess when they approached him the first day of intervention and interacted

while in the line for wall-ball. Table 10 visually represents this short latency as TS2 moved from baseline to intervention with no overlapping data points. He continued to make eye contact as he and his fellow players were in line each day, and often visually referenced them as they chatted. TS2's overall daily frequency average during the intervention phase was 21.0 (range, 10–33 instances) as he played wall-ball with classmates. Visual analysis of Figure 10 indicates an increasing linear trend until it peaks at a high level halfway through the phase and then begins to decrease. On the first day of the four generalization probes, TS2's level decreased a bit from that of intervention, although he demonstrated consistent eye contact while sitting in the cafeteria with two other boys as they ate lunch. While demonstrating reciprocal conversation with the boys across the table, TS2's observed average frequency of making daily eye contact was 26.3 times, (range, 16–42 occurrences). The graph in Figure 10 indicates an increasing trend that spikes during the third day of the generalization phase and then decreases during the last probe.

TS4 either played by herself on the swings or walked alone during much of baseline. She was observed to demonstrate eye contact with others on an average of 7.2 times per session, (range, 6–9), but no visible trend is suggested in her baseline graph. However, she demonstrated immediate eye contact with her peer trainers on the first day of intervention when they approached her and asked if they could swing with her. There was an immediate change during the latency period that included no overlapping data points. During intervention, TS4 averaged 21.3 observed eye contact behaviors, (range, 19-29 instances). The graph in figure 10 indicates an overall higher level of eye contact throughout intervention than in baseline, although the data oscillations do not suggest a

trend. TS4's eye contact continued through the intervention phase as she and the peer trainers played games throughout the next few months on the playground. During the generalization phase, TS4 sat by herself on the first day, which is visually represented by a lower level of frequency than that of her last intervention session. However, TS4 was joined part way through lunch by another girl who had joined TS4 and her peer trainers at recess. During the following three probes, she increased her eye contact so that it reached the level at which it had been observed during intervention. She was observed making eye contact an average of 25.0 times per session, (range, 19-29 instances) throughout this last phase. As noted in Figure 10, TS4's graph indicates a slow and steady increase in trend within the generalization phase.

Social verbal response. The frequency of each of the target students' social responses was measured by observation of the following: (a) looking toward another when name was called ; (b) following directions or a request; (c) answering a question; (d) making a comment; and/or (e) nodding one's head. Frequency was measured and reported for each of the five behaviors as the number of counted observations.

At School 1, TS 1 did not immediately demonstrate verbal response during the baseline phase and the graph indicates an overall flat trend at a very low level. During this first phase, her overall average frequency average of verbal responses was 2.0, (range, 1-3 instances) over the five sessions. Her peer trainers approached her and asked her to join a game with them on the first day of intervention, and TS1 followed them, demonstrating only a few responses. The latency was immediate that day with no overlapping points, but the first day's data frequency level was only two points above the last baseline phase data point (see Figure 11). The level, or magnitude, of the data

varied throughout the intervention phase in a slight increasing trend over the following weeks. TS1's average frequency of verbal responses per intervention session was 11.3, (range, 2.0 -24.0) as indicated in Figure 11. Although the responses were related to the questions, TS1 also added to her responses (e.g., she added information about her pet when asked about her favorite animal). As previously noted, there were several sessions throughout the intervention in which the peer trainers and TS1 played a game named Statues in which they could not speak or move after being placed in a specific pose. This game did make the girls giggle and TS1 was one of the first to start laughing. During the generalization probes, TS1 was observed in reciprocal conversations with two girls at her table while eating her lunch. Her average verbal response frequency per session in this generalization phase was 20.0, (range, 15–30).

As the graph in Figure 11 indicates, TS3 at School 1 verbally responded only a few times during baseline and the data points of that phase show a relatively flat line with no trend. His average frequency was 0.4 verbal responses overall, (range, 0-1 occurrences) during baseline. TS3 immediately increased his verbal responses to direct questions during the intervention phase, and Figure 11 indicates no overlapping data points between baseline and intervention. The peer trainers eased into the first few sessions by dribbling basketballs and making comments or asking questions as they passed TS3. If a question was asked that related to one of his preferred interests, TS3 would stop and hold his basketball to respond even when it was someone else's turn to answer. However, if not interested in the topic of a question, he would respond in a nodding gesture or one-word response and start dribbling his basketball. His average frequency of verbal responses over all of the intervention sessions was 8.5, (range, 5.5 -

11 instances). No trend is evident across intervention, although there are level changes throughout with a decrease in the middle of the phase. The only verbal responses TS3 offered during generalization were as a result of functional questions asked by peers who sat at the same lunchroom (e.g., "Is anyone sitting here?" and "Is that my milk or your milk?"). As previously noted, TS3 appeared to be very uncomfortable having to share his lunchtime and space with others, and his level of frequency fell near that of the baseline observations (see Figure 11). His average frequency of verbal responses during all four generalization probes was 2, (range, 1-3 occurrences).

At School 2, TS2 started baseline with few responses, averaging a frequency of 2.8 verbal responses, (range, 2-5 instances) over the phase. An increase during the last session of baseline, however, began an upward trend in his verbal responses that continued until the beginning of intervention with immediacy and no overlapping data points. This increasing trend is seen in Figure 12 throughout the first half of intervention where it decreases straight down and across for two data points before increasing once more. This decrease reflects two days in a week of rain and windstorms that made it necessary for all students to move to the covered area, so TS2's wall-ball section was filled with other students and he became separated from the peer trainers. When the students returned to recess the next week, the peer trainers were observed standing next to TS2 in the line throughout the wall-ball game, and the graph indicates a spike in frequency that first day back. There was a level decrease on a day in the second half of the intervention when one of the peer trainers left recess early to be picked up by a parent for a dentist appointment. The average frequency of observed verbal responses in TS2 was 21.7, (range, 8- 39 occurrences) throughout intervention. During the

generalization probes, TS2 politely responded at first to a student who sat across from him at the table, but was observed to be more lively and conversant with two other students who sat with him during the third session, as seen in the level change in that phase in Figure 12. TS2's average frequency of verbal responses during the four generalization probes was 19.25, (range, 17-25 occurrences).

Also at School 2, TS4 verbally responded very little during the baseline phase and no trend or level changes were evident. She was observed swinging by herself for most of this phase and her average frequency of verbal responses was 3.2, (range, 2-4 occurrences) throughout the phase. However, her level of frequency increased upon entering intervention as the peer trainers joined her and asked her to play a chase game with them. Latency was immediate with no overlapping of data points between baseline and intervention. An increasing trend is indicated in Figure 12 as the peer trainers began to ask TS4 each day what she wanted to play. At about mid-intervention, the frequency reached a spike and then decreased within the last two weeks of intervention when she preferred to swing for most of the recess. TS4's average daily frequency of verbal responses was 17.2, (range, 10-31 instances) throughout the intervention phase. TS4 began the generalization phase sitting alone at a cafeteria table but several students soon joined her and her verbal responses exceeded the level at which her frequency had ended during intervention (Figure 12). This group of girls, which included a new girl who had asked to join TS4 and the peer trainers at recess several times, was observed to be quite reciprocally conversant. The graph displays a somewhat curvilinear trend down and then up, and TS4's overall average frequency of verbal responses during generalization

probes was 20, (range, 19-22 instances) throughout this last phase, as indicated in Figure 12.

Social initiations. The frequency of each of the target student's social initiations was measured by observation of the following: (a) greeting another student, (b) asking a student a question (e.g., "Do you want to play?"), (c) making a comment to a student, (d) offering to share a playground item, and (e) saying a peer's name.

TS1 continued to quietly play by herself as baseline commenced, and was only observed asking a question or making a short comment when the students lined up to go back into the building after recess. (Most of her observed social initiations were approaches to staff, which were not counted as data.) Figure 13 visually indicates a flat line with no trend and few changes in level. TS1's observed average daily frequency of social initiations was 4.5 (range, 3-4 initiations) throughout baseline. As she moved into intervention, latency was immediate and indicated to be at a data point just above her last recess data in baseline (see Figure 13). TS1 started to slowly increase her initiations as her comfort level in making comments or even asking questions about the games that she and the peer trainers were going to play also appeared to increase. Overall, no specific trend was evident and her average observed daily frequency of this behavior during intervention was 8.4 social initiations, (range, 4-12 occurrences). After the gap of five weeks between intervention and generalization, TS1 initially entered the new phase only a data point from the last intervention data point and then varied in social initiations according to the girls who sat within her proximity at the lunch table. TS1's average daily observed frequency over the generalization probes was 12.8 social initiations, (range, 8-7 instances).

The graph of School 1 (see Figure 13) indicates that TS3 was only observed socially initiating twice during baseline. No trend or variation in level was evident. His average daily frequency was 0.2 social initiations, (range 0-1 initiations) over all sessions of this phase. When his peer trainers joined him on the first day of intervention, he made three initiations asking one students about a basketball that he was using, but he appeared more relaxed with the target students around him only by the end of recess. There was a slight increase in frequency, although no overlapping of data points between the two phases is evident. One method that two peers utilized to encourage TS3 to talk and initiate was to ask him questions about Boy Scouts, which he answered while standing still (as he ceased to travel in his usual circle around the area he claimed under the awning). He was also very interested in talking about martial arts. On another occasion, TS3 was asked a question about video games and he became very excited to share his favorite. He often required suggestions and requests from the peer trainers so that one of them could talk, and did not seem aware of the expectation of allowing reciprocal conversation from the others. During the intervention, TS3 averaged a daily frequency of 4.9 social initiations, (range, 3- 6 initiations) over all sessions. An increase in trend for the first few data points was noted at the beginning, and then again at the end, of the phase as the frequency level varied. During generalization, TS3 appeared reluctant to initiate until the third probe, during which a table partner from his classroom sat with him and showed him a calculator, which interested him and prompted him to ask questions. During the four generalization probes, TS3's average daily frequency was 1 social initiation (range, 0-3 initiations) over the phase, as visually represented in Figure 13 by a slight increase in trend.

Figure 14, a graph of School 2, indicates that TS2's trend line and level were relatively flat over baseline as he was observed quietly playing wall-ball without much interaction with others in the game. During baseline, TS2's observed frequency of social initiations averaged 6.2 per day, (range, 5-7 occurrences) over the entire phase. Latency was noted as an immediate change in level with no overlapping data points as he moved from baseline to intervention. There was no trend evident although the level varied up and down. The eighth session was cancelled outside due to freezing rain, and so the observers and the student investigator followed the target students to their classrooms. TS2 sat at a table talking with his teacher while other students played games and watched and interacted with the "Go Noodle" video. TS2's peer trainers joined him at the table and began to talk with their teacher, which spurred conversations among all of them. This continued until one of the students suggested the foursome go to the screen to interact with the video where most of the other students had congregated. All students giggled as they attempted to mimic the dance steps, and TS2 made some comments that resulted in laughter. This interaction resulted in a data spike on this session in the graph of the intervention. Similar spikes were noted later in the intervention, one of which was on another day when the students had indoor recess, and were possibly able to talk more without moving in line such as while in wall-ball. During intervention, TS2's observed daily average frequency of social initiations was 13.6, (range, 8-20 instances) across the phase. On the first day of generalization probes, TS2 sat in the lunchroom at a table eating his lunch by himself for the first eight minutes until two other boys joined him. Thus, that first data point was lower than the last intervention data point. There was no trend observed across the variable level of the four data points in this phase. However,

one of the boys appeared to have joined TS2 and his peer trainers during many of their wall-ball games and so he may have joined them due to the "halo effect" which describes the phenomenon of students being attracted to other students who seem to be pursued by well-like peers (i.e., the peer trainers) as discussed in the literature review (Kasari et al., 2012; Owen-DeSchryver et al., 2008). During the four sessions of generalization probes, TS2's average daily frequency of social initiations was 10.8, (range, 8-16 instances) over the phase, as noted in Figure 14.

As noted in previous discussions of Target Student 4 during the study, she was observed swinging for most of the baseline phase and only occasionally initiated socially when classmates sat next to her on a swing or when she asked a peer if they were going to be swinging very long as she waited in line. Figure 14 indicates that no trend was evident in her baseline data and that the level of frequency remained relatively the same. During this phase, TS4's observed daily average frequency of social initiations was 4.7, (range, 4-6 initiations). When she moved to intervention and was greeted by the peer trainers, latency was immediate as her frequency increased quite a bit with no data points overlapping with baseline. An increasing trend in TS4's social initiations was noted for the first five intervention sessions as she and her peer trainers played in close proximity to each other in games such as "Guess Who I Am?", "Mother, May I?", and other group games. However, the triad and TS4 played games such as "Hide-n-Go-Seek" for the next six sessions, which did not require as many social initiations on her part. When the group played "Red Rover" at the end of the phase, however, an increasing trend in initiations was observed to begin again, as noted in Figure 14. During intervention, TS4's observed average daily frequency of social initiations was 13.4,

(range, 9-21 occurrences) throughout the phase. During the generalization probes, TS4's social initiations varied according to whether her new friend sat with her at the lunch table. This student had been attracted to the bevy of peer trainers during the intervention (another case of "halo effect"), and this girl and TS4 continued their friendship after the intervention was completed. Although TS4 was observed initiating with others at the lunch table, the frequency was observed to be higher when her friend was present. Even though there were only four generalization observations, an increasing trend was evident. TS4's observed average daily frequency of social initiations over this last phase was 17.0, (range, 10-24 occurrences).

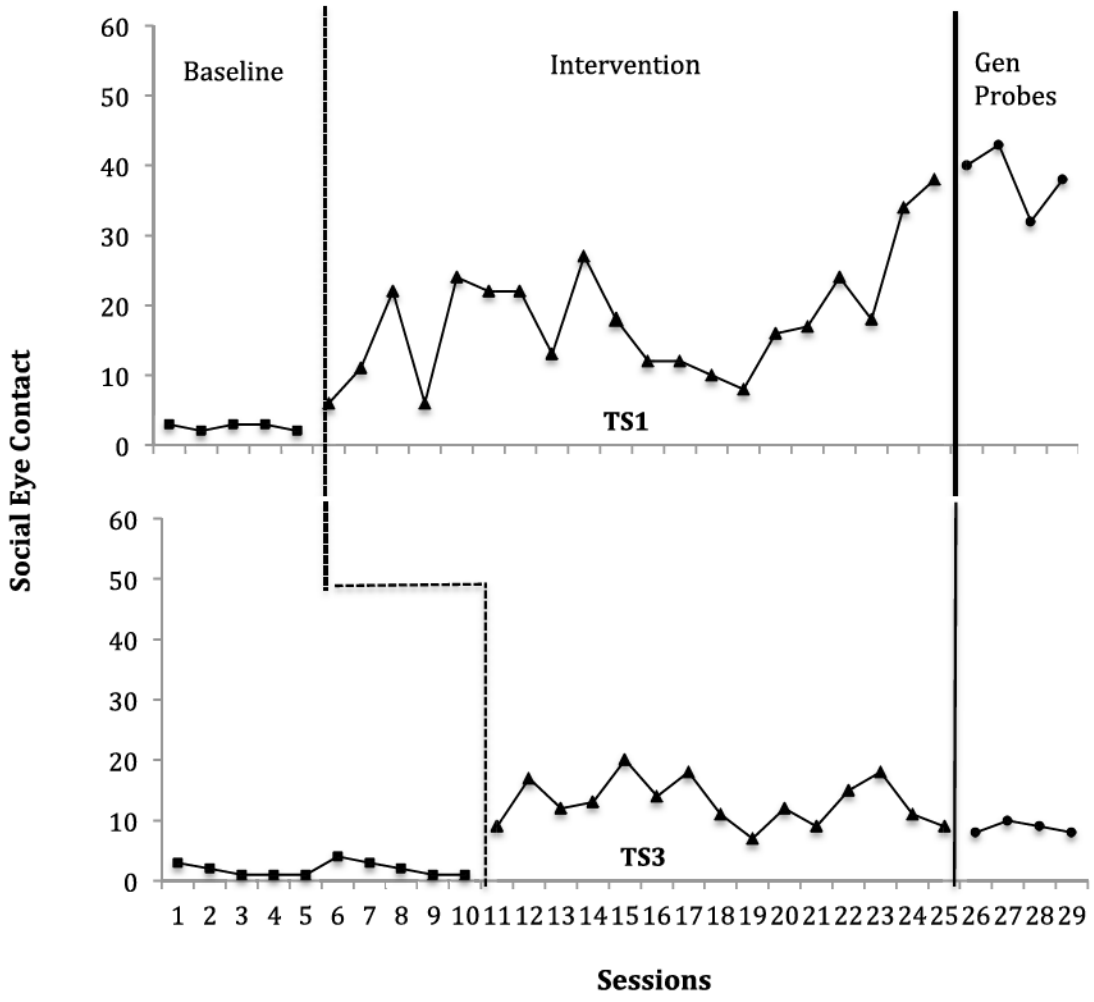

Figure 9. Frequency of social eye contact in TS1 and TS3 in School 1

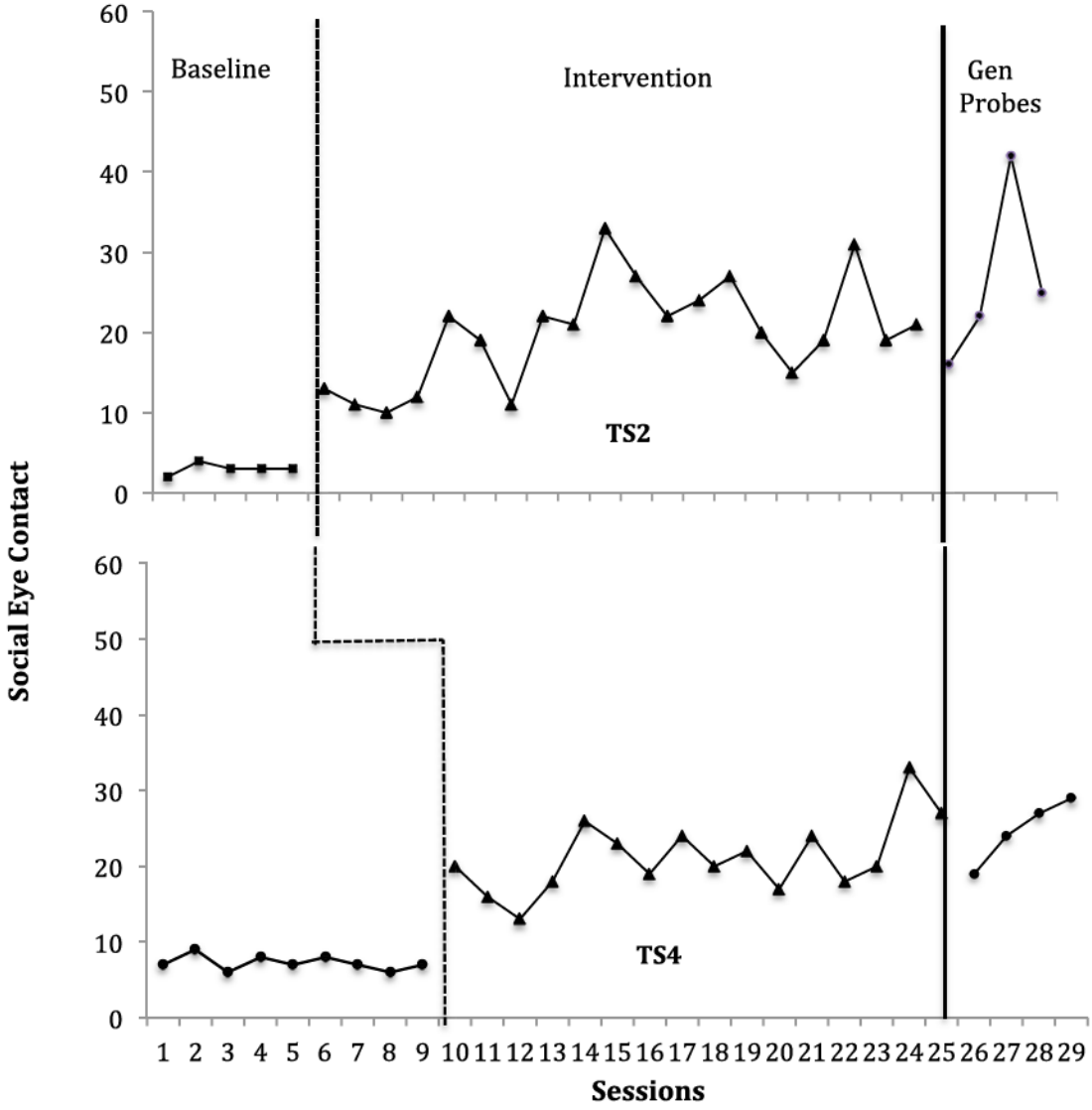

Figure 10. Frequency of social eye contact in TS2 and TS4 in School 2.

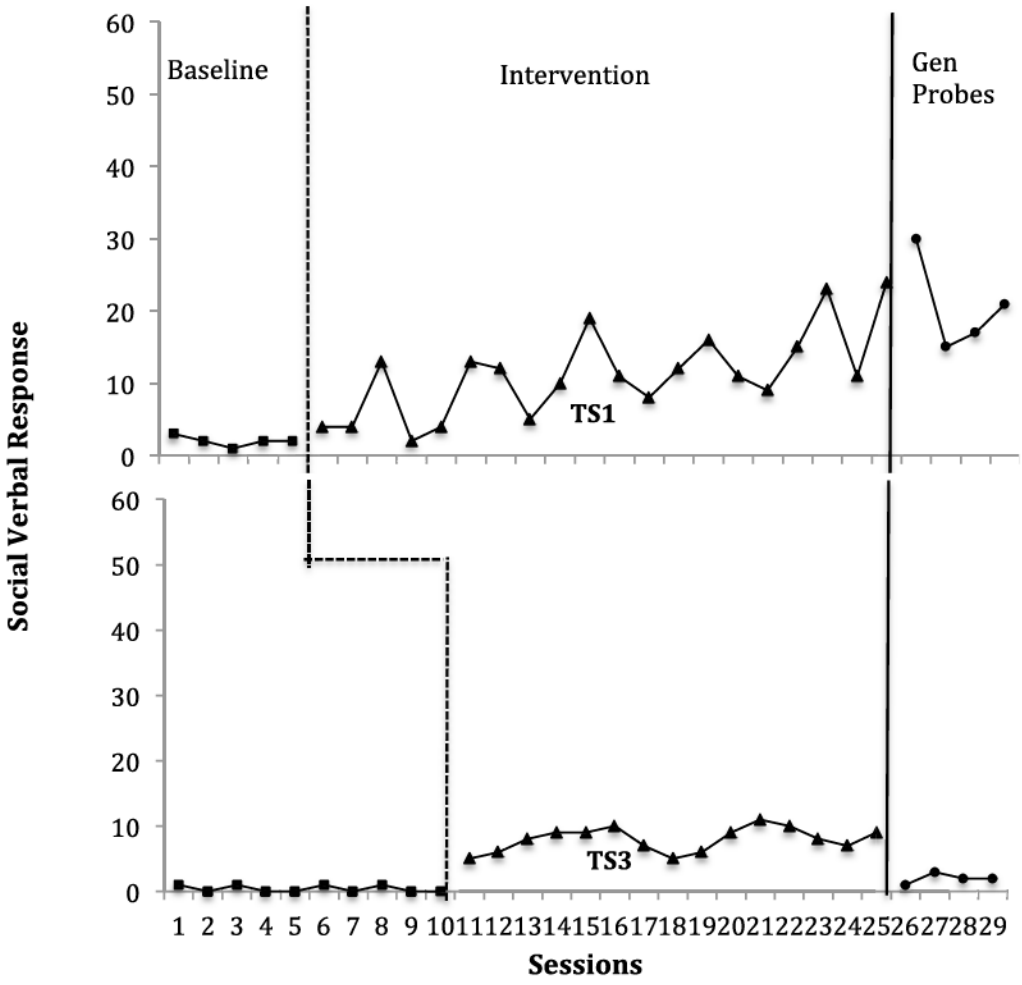

Figure 11. Frequency of social verbal response in TS1 and TS3 at School 1.

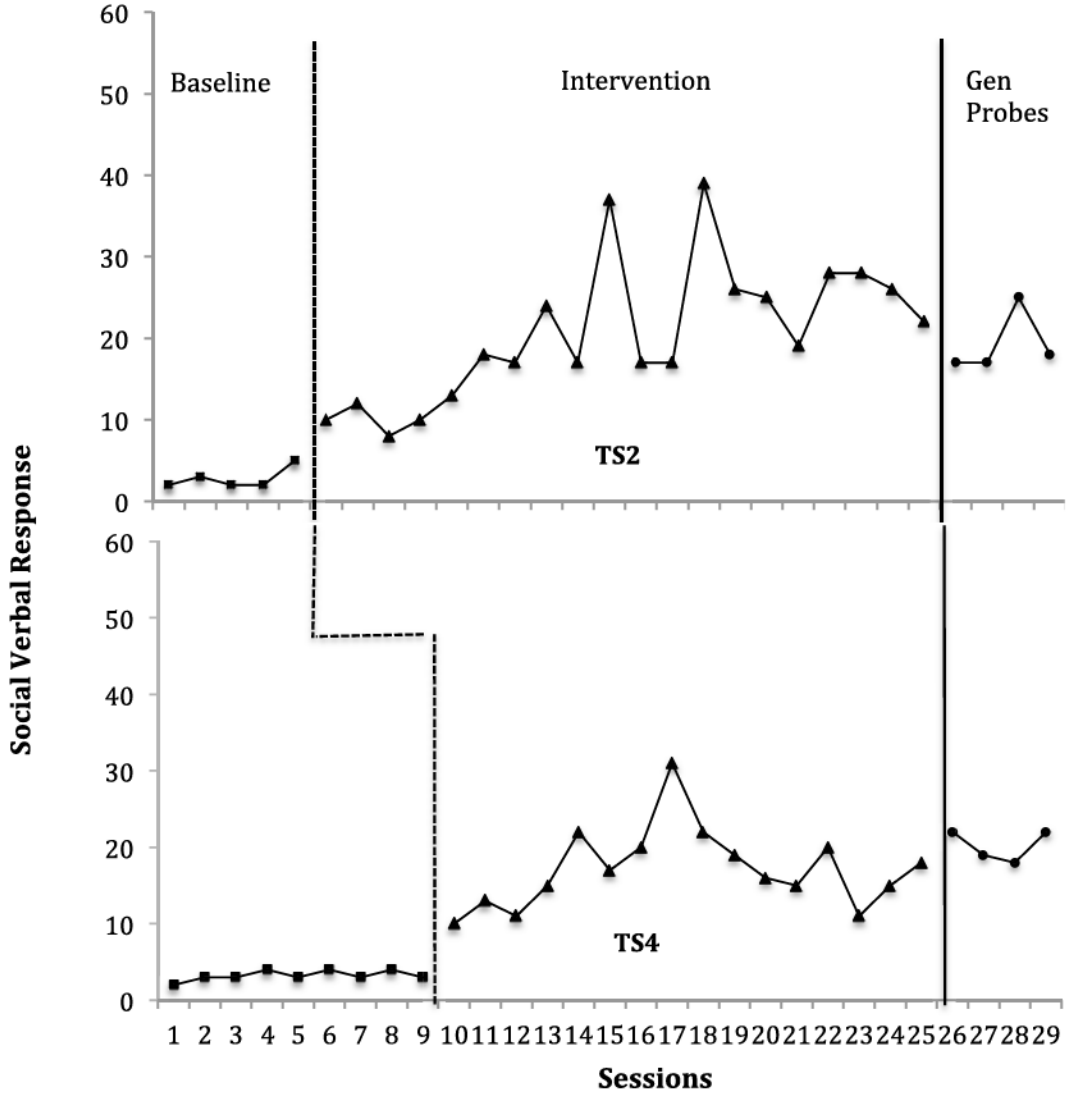

Figure 12. Frequency of social verbal response in TS2 and TS4 at School 2.

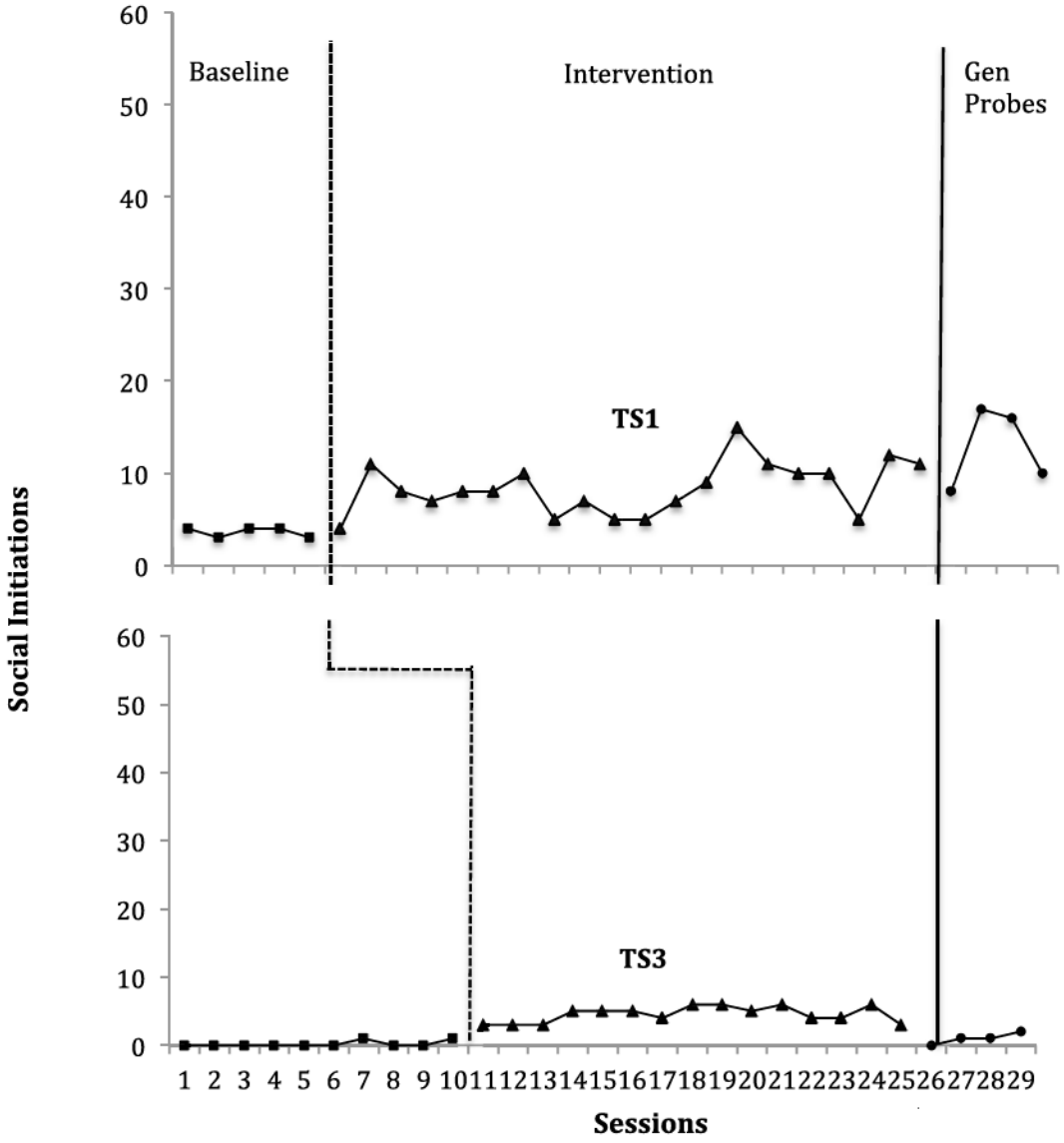

Figure 13. Frequency of social initiations in TS1 and TS3 in School 1

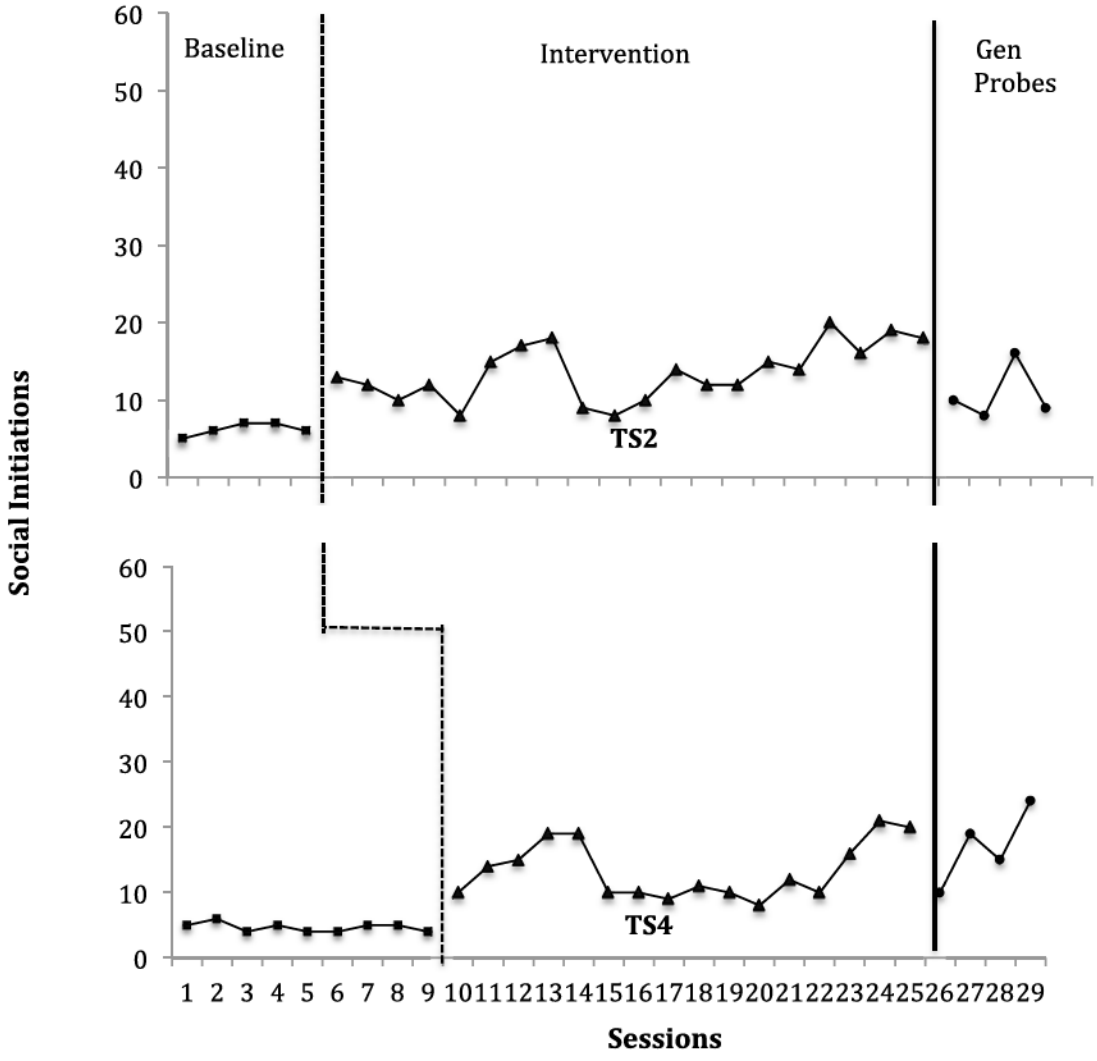

Figure 14. Frequency of social initiations in TS2 and TS4 in School 2

Response to RQ1. This research question examined the effects of peer-mediated social skills facilitation on the frequency of social eye contact, social responses, and social initiations of elementary students with HFA. A synopsis of the results will be discussed according to the specific social behavior, by paragraph, as follows:

Social eye contact was observed in all four target students immediately upon leaving baseline and entering intervention with the peer trainers who facilitated the interactions with the strategies they learned through specific instruction. In all four

target students, a latency of immediate change with an increase in level of frequency was observed, and the level never returned to baseline. After ten weeks of the intervention phase, no observations occurred for five weeks until generalization probes were conducted. This last phase occurred two times a week over two weeks for ten-minute sessions in the cafeteria without the peer trainers present. None of the four target students returned to baseline levels while in generalization and some even exceeded the frequency level they had demonstrated during intervention. Thus, a functional relationship was indicated between the mediation of social skills by the trained peers and the immediate increase in frequency of social eye contact of all target students.

Social verbal response was also observed in all four target students immediately upon leaving baseline and entering intervention with the peer trainers who facilitated the interactions with the strategies they learned through specific instruction. In all four target students, a latency of immediate change with an increase in level of frequency was observed, and the level never returned to baseline. During the generalization phase with no peer trainers present, three out of the four target students never returned to baseline levels and some even exceeded the frequency level they had demonstrated during intervention. Thus, a functional relationship was indicated between the mediation of social skills by the trained peers and the immediate increase in frequency of social verbal response of all target students.

Social initiation was also observed in all four target students immediately upon leaving baseline and entering intervention with the peer trainers who facilitated the interactions with the strategies they learned through specific instruction. In all four target students, a latency of immediate change with an increase in level of frequency

was observed, and the level never returned to baseline. During the generalization phase with no peer trainers present, three out of the four target students never returned to baseline levels and some even exceeded the frequency level they had demonstrated during intervention. Thus, a functional relationship was indicated between the mediation of social skills by the trained peers and the immediate increase in frequency of social initiations of all target students.

In response to RQ1, social-skills mediation of trained peers was followed by an immediate increase in the frequency of social eye contact, verbal responses, and social initiations in all four target students with HFA as noted in their respective moves from baseline to intervention.

Research Question 2: What is the effect of social skills mediation by trained peers on the quality of social engagement of elementary students with high-functioning autism? The Target Skills worksheet (see Appendix E) was also utilized to document the *quality* of social behaviors. Each of the target student's social responses was measured by observation of the following: (a) three or more reciprocal exchanges; (b) walking with or sitting together with another student while talking; and (c) engaging in a game or activity for at least two minutes. The observer/coders utilized the technique of Momentary Time Sampling to code the social engagement behaviors at 15-second intervals per their timers (forty intervals of 15-seconds in each ten-minute observation). At every beep, the observers immediately coded the behavior(s) occurring at that time. Quality was measured by the percentage of intervals out of the total 40 intervals in which coders observed one or more of the three social responses listed above. Thus, it should be noted that the scale on this multiple-baseline graph is 0-100 due to the fact

that quality was measured as percent (Figure 15).

In School 1, TS1 was observed during baseline to be socially engaged, per the criteria above, for a daily average of 7.2 % of the intervals per session, (range, 1 to 18% of intervals) over all this phase. She immediately moved to a higher level from baseline to intervention upon peer facilitation of social strategies. No trend was evident during baseline, but there was an increasing trend for seven sessions, after which there were variations of the level with little trend evident. During intervention, TS1 was observed to be socially engaged for a daily average of 70.4% of the intervals, (range, 15 - 99% of intervals) over all sessions of this phase. Her social engagement continued at about the same level as she entered the generalization phase, although an increasing trend was noted among the four sessions. TS1 was observed to be socially engaged for a daily average of 86.3% of the intervals, (range, 80 - 93% of intervals) over all sessions of generalization, as noted in Figure 15.

TS3, also at School 1, was much less responsive to the peer mediation than TS1. During baseline, he was observed to be socially engaged for a daily average of 0.2 % of intervals, (range, 0 – 1% of intervals). He often seemed relieved to be left alone to walk circles and dribble a basketball. When he entered intervention, however, TS3 demonstrated an immediate increase in behaviors that was followed by a decreasing trend for the next four sessions. From the sixth session on, his data points demonstrate an increasing trend until the end of intervention. TS3 was observed to be socially engaged for a daily average of 21.9% of the intervals (range 10 - 30% of intervals) over all of intervention. When TS3 began the generalization phase in the cafeteria without peer trainers present, he demonstrated few social behaviors and appeared to avoid sitting

near other students in the cafeteria. During these four probes, his daily average of observed social engagement was 8% of observed intervals for the phase, (range, 5% - 10% of intervals).

Because he was engaging in a game (wall-ball) throughout most of the study, and occasionally made comments to other players about a move, TS2's average daily social engagement was observed to be 40.8% of intervals, (range, 39 - 42% of intervals) as noted in Figure 16. However, TS2 also reached a high level of overall quality of social engagement during the intervention phase as he was typically engaging in the game or talking with the peer trainers when standing in line (which he did not demonstrate during baseline). He was observed to be socially engaged for a daily average of 84.2% of intervals, (range, 79 - 92% of intervals) during intervention. During the generalization probes, TS2 was observed talking or reciprocating with several boys sitting at his cafeteria table. His daily social engagement during generalization averaged 82.3% of the observed intervals, (range, 81 - 83% of intervals).

During baseline, TS4 was observed swinging with other students, which included some commenting as well as laughing and competing with others to see who could swing the highest. During this baseline phase, TS4 was observed to be socially engaged for a daily average of 34.5% of intervals, (range, 25 - 45%). When the peer trainers joined her the first day of intervention, TS4 immediately responded with a higher level of social engagement, which is then depicted on the graph in Figure 16 as an increasing trend before it plateaued and then decreased again. During the intervention phase, TS4 was observed to be socially engaged for a daily average of 76.4% of intervals, (range, 45 - 95% of intervals). When generalization began five weeks later, Figure 16 indicates

that TS4 was observed at a level lower than where she ended in the intervention phase, but she quickly surpassed that level as she socially engaged with a girl who had joined her and the peer trainers at recess. During this phase of four generalization probes, TS4 was observed to be socially engaged for a daily average of 84.5% of intervals, (range of 73 -92% of intervals) as indicated in Figure 16.

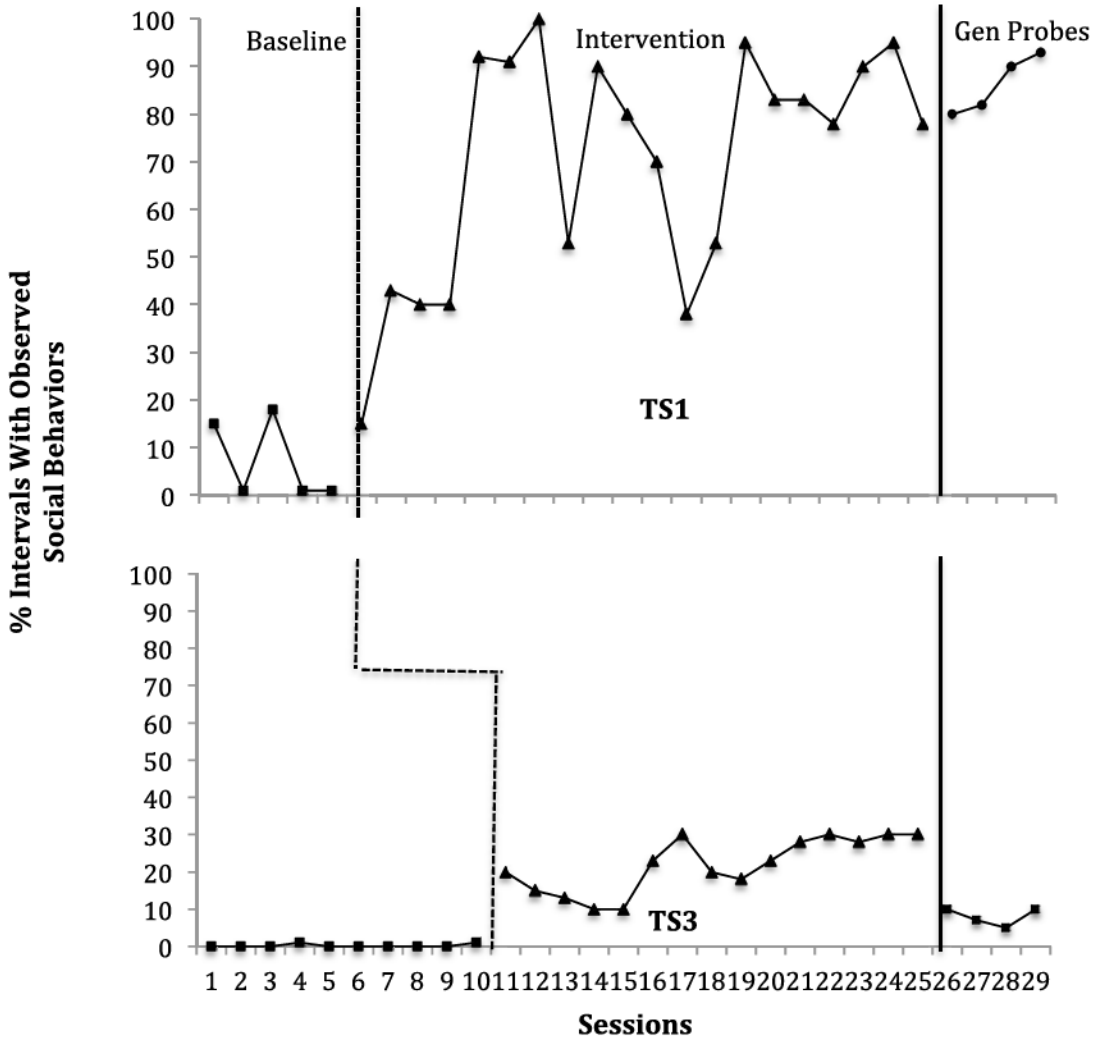

Figure 15. Quality of social engagement in TS1 and TS3 at School 1.

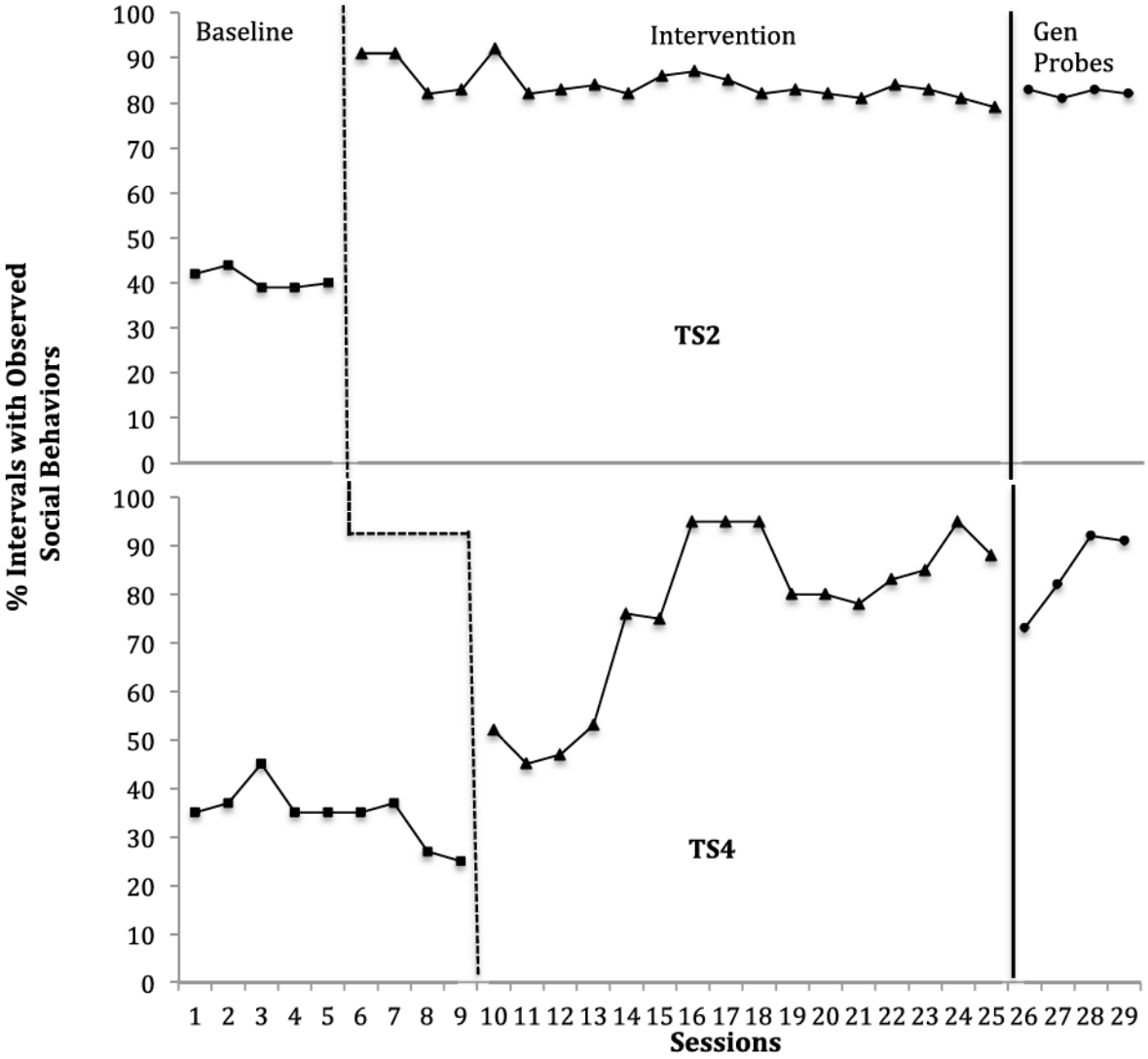

Figure 16. Quality of social engagement in TS2 and TS4 at School 2.

Response to RQ2. Research Question Two examined whether peer-mediated social skills facilitation could affect the overall quality of social engagement of elementary students with HFA.

Using the Momentary Time Sampling method, all four target students were observed to increase in the percentage of social engagement within time intervals as they moved into intervention. These increases were noted by immediate latency and a higher

level of percentage observed in each of their respective intervention intervals than observed in baseline. Three out of the four target students maintained a similar level of percentage per interval during the four generalization probes five weeks later. In summary, social-skills mediation of trained peers was followed by an immediate increase in the quality of social engagement in all four target students with HFA.

Parent and recess duty teachers' ratings of increase in social responsiveness. Research questions one and two were not only addressed by visual representation of the multiple baseline design graphs that are presented above to respond to both questions, but also by the parent and school staff perceptions of change in the target students' social skills over the timeline of the intervention. Parents of the target students completed the parent form of the *Social Responsiveness Scale - Second Edition (SRS-2*) before the intervention, midway through, and two weeks after the last intervention session. The recess duty staff completed the teacher form of the SRS-2 on the same schedule.

According to Constantino & Gruber (2012), the *Responsiveness Scale-Second Edition (SRS-2)* is a standardized 65-item Likert-scale rating system used to measure the impact of social deficits associated with ASD. The norming process was conducted on a sample of more than 2,025 school-age children and separated by identity of rater (parent or teacher) and gender of the child who was rated in the following areas: (a) social awareness, (b) social cognition, (c) social communication, (d) social motivation, and (e) restricted interests and repetitive behaviors of autism. Descriptions of these categories are as follows:

- *Social Awareness* is the ability to pick up on social cues. This category represents the sensory aspects of reciprocal social behavior.
- *Social Cognition* is the ability to interpret social cues once they are picked up. This category represents the cognitive-interpretive aspects of reciprocal social behavior.
- *Social Communication* is the expression of the act of communicating socially. This category represents the "motoric" aspects of reciprocal social behavior.
- *Social Motivation* is the extent to which an individual is generally motivated to engage in social-interpersonal behavior. The elements of social anxiety, inhibition, and empathic orientation are included in this category.
- *Restricted Interests/Repetitive Behaviors* include stereotypical behaviors or highly restricted interests that are characteristic of autism.

Table 16 (below) presents the results of both sets of respondents. When reading the table, it should be noted that the lower the score, the lower the severity of characteristics of autism that were endorsed by the respondent. T-score categories are assigned as follows: 59T and below is within Normal Limits; 60T-65T denotes Mild Range; 66T-75T denotes Moderate Range, and; 76T or above denotes Severe Range. Even though decreases in mean scores indicate if observed social skills have increased or decreased for the whole group, statistical significance cannot be ascertained without using statistical comparison methods.

Table 16

Parent and Staff Responses to Social Responsiveness Scale-2nd Edition (SRS-2)

RATER:	PARENT			RECESS DUTY		
	PRE	MID	POST	PRE	MID	POST
TS1						
SRS-2 TOTAL	57	56	47	82	83	79
Social Awareness	66	59	44	70	68	73
Social Cognition	57	57	47	84	82	72
Social Communication	55	55	48	78	78	77
Social Motivation	57	56	47	72	71	67
Restricted Interests/ Repetitive Behaviors	54	54	48	89	90	81
TS2						
SRS-2 TOTAL	67	68	68	68	68	67
Social Awareness	75	57	73	66	64	70
Social Cognition	76	74	74	70	70	69
Social Communication	68	68	64	65	64	62
Social Motivation	56	58	56	70	69	64
Restricted Interests/ Repetitive Behaviors	69	68	68	67	68	66
TS3						
SRS-2 TOTAL	73	73	68	86	84	83
Social Awareness	56	57	57	74	81	76
Social Cognition	65	67	65	73	79	74
Social Communication	73	73	69	86	80	83
Social Motivation	80	79	73	84	84	82
Restricted Interests/ Repetitive Behaviors	68	68	62	84	82	84
TS4						
SRS-2 TOTAL	68	67	61	68	69	67
Social Awareness	64	66	53	66	64	64
Social Cognition	56	53	55	59	58	54
Social Communication	66	68	59	74	75	71
Social Motivation	58	56	51	59	61	61
Restricted Interests/ Repetitive Behaviors	78	78	76	73	68	71

Statistical analysis was conducted to examine whether the social skills facilitation intervention had an effect on the social responsiveness of the four target students according to both recess teachers and parents. The number of cases in this data set did not meet the criteria of distribution required by the one-way ANOVA test with repeated measures, so the Friedman test was selected to statistically analyze results. The Friedman test is the non-parametric alternative to the one-way ANOVA with repeated

measures and can be utilized to test for differences between groups when the dependent variable being measured is ordinal. It can also be used for continuous data that has violated the assumptions necessary to run the one-way ANOVA with repeated measures (e.g., data that has marked deviations from normality).

Two separate tests were run, the Parent Response data set and the Recess Duty Teacher data set. Within each test, three variables were assigned to the SRS-2 result data across time: pre-test scores, mid-test scores, and post-test scores.

The Friedman test on the mean ranks of the parent's scores from the pre-, midway, and post-intervention checklists (Table 17) indicated that, although there were some changes in scores along the timeline, there was not a statistically significant difference in the parents' perception of their children's overall social skills between the times that the pre- and mid-intervention administrations of the SRS-2 occurred and the last post-intervention was administered, $\chi^2(N = 4, df = 2) = 2.71, p > .05$.

Table 17

Friedman Test: Statistical Results of the Parent Responses to Pre-, Midway Through, and Post-intervention Administrations of the SRS-2 per SPSS Analysis

Time Measure	*M*	*(SD)*
Pre-Parent	66.25	(6.70)
Mid-Parent	66.00	(7.16)
Post-Parent	61.00	(9.90)

The Friedman test on the mean ranks of the recess duty teacher's scores pre-, midway, and post- interventions, as shown in Table 18, indicated that there was a statistically significant difference in the recess duty teachers' perceptions of the target students' overall social skills on the playground between the times that both the pre- and

mid-intervention administrations of the SRS-2 occurred and the last post-intervention administration was conducted, $\chi^2(N=4, df = 2) = 6.533, p = 0.038$.

Table 18

Friedman Test: Statistical Results of the Recess Duty Teachers' Responses to Pre, Midway through, and Post-intervention Administrations of the SRS-2 per SPSS Analysis

Time Measure	*M (SD)*
Pre-Recess Duty Teacher	76.00 (9.38)
Mid-Recess Duty Teacher	76.00 (8.68)
Post-Recess Duty Teacher	74.00 (8.25)

The differences in observations between the parents and recess teachers may be explained by the different contexts of the school and home. The recess duty teachers may rate the target students according to the socialization levels of the same-age peers in a school setting, such as a classroom or playground. Although the SRS-2 is frequently referred to as a measure of "social impairment," many items describe other core features of ASD, including communication deficits and repetitive behaviors (Constantino & Gruber, 2012). Without explicit instructions, it is unclear how parents rate items that are not applicable to their child, such as items assessing conversation and interaction of an only child with little to no social interaction with same-age peers in the household (Hus, Bishop, Gotham, Huerta, & Lord, 2013).

Research questions one and two are also addressed through the responses on the parent SRS-2 and the teacher SRS-2, which provide social validity. The test scores of the recess duty teachers improved over the timeline of the study, suggesting an increase in positive perception of the target students' social skills. The Friedman test also

indicated that there was a statistically significant difference in the recess duty teachers' ratings of the target students' social responsiveness between the times that both the pre- and mid-intervention administrations of the SRS-2 occurred and the last administration post-intervention was conducted. The SRS-2 ratings on the parent's checklists from the pre-, midway, and post-intervention checklists did indicate changes in scores along the timeline, reflecting more positive parental perceptions by the end of the study. However, there was not a statistically significant difference in the parents' scores, according to the Freidman test. The Friedman test rank-orders the total measures for each subject and so the analysis provided a mean rank for each pre-, mid-, and post-rating of the two groups (parents and recess duty staff). Figure 17 visually compares all three sequential ratings of both sets of respondents by mean rank.

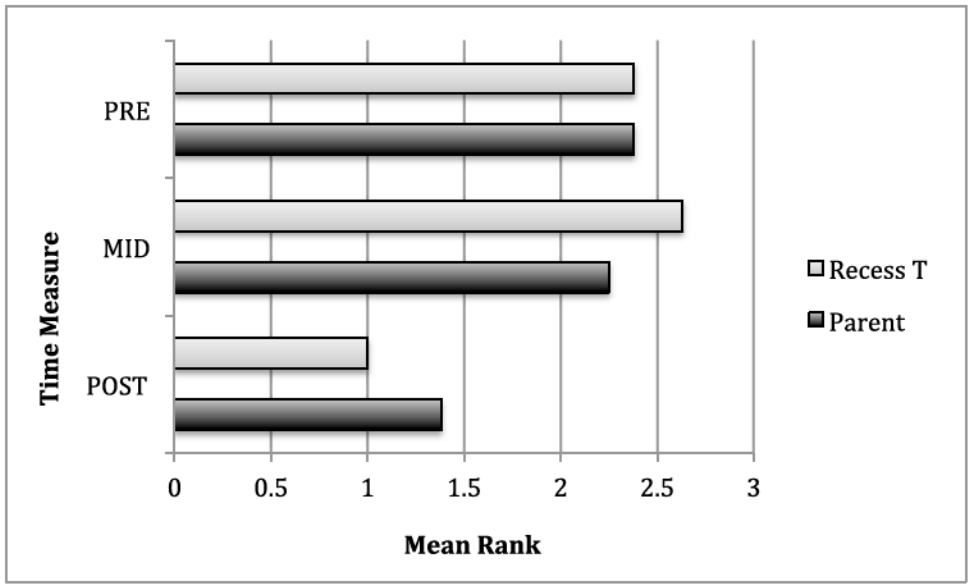

Figure 17. Comparison of SRS-2 ratings of target students by respondent: recess teacher and parent.

Research Question 3: How does compatibility between the target student and peer trainer further vary the frequency of the social interactions of students with high-functioning autism? The peer trainers were matched with the target students according to their responses on the fill-in-the-blank form, *Student Interest* that was completed before the study began *Survey* (see Appendix I). The responses were entered into Google Analytics and the overlaps in interests for each of the four target students and peer trainers were matched. The results, by target student, are displayed in the four tables in Appendix N.

In order to explore the peer trainers' perceptions of whether or not those overlaps in interests increased their compatibility among the target students, they were asked to complete an anonymous *Follow-up to the Student Interest Survey* (see Appendix K) that allowed the student investigator to calculate the percentage of probes that overlapped on the original *Student Interest Survey* and were perceived to be helpful.

Results of the anonymous survey indicate that talking about the same favorite school subjects, special times with family, favorite foods, travel interests, games and sports, leisure activities, and books and movies made it easier for peer trainers to start conversations and keep those conversation going. The peer trainers noted that they believed these topics helped them get to know their target students better as they began implementing and modeling social skills. Discussing vacation sites and favorite teachers throughout the years were rated as the least utilized factor that prompted interest and social interaction are listed in Table 19.

As noted by Hurley (2012), evaluation of consumers' perceptions of being involved in a study can provide not only satisfaction to those consumers but also more

validity to an intervention. Another anonymous section of the follow-up questionnaire allowed the peer trainers to respond to two open-ended questions and evaluate their perceived benefits of the study for the target students, as well as for themselves. Table 20 lists the ways in which peer trainers believed they helped their target students.

Table 19

Peer Trainers' Perceived Success of Compatibility Match

I would like you to share how well you feel matching your Student Interest Survey responses with those of your Student Buddy helped you be a social model for him/her. Please read each statement below and mark whether it was Always True, Sometimes True, or Never True:	Always True *N (%)*	Sometimes True *N (%)*	Never True *N (%)*
1. Being matched with a student buddy who likes some of the same subjects in school helped me get conversation started.	5(42)	7(58)	0
2. Talking about favorite vacation places that both my student buddy and I had in common (because we have been there or want to go there) was an easy topic for conversation.	3(25)	6(50)	3(25)
3. Talking about the games we like on the iPad helped us get to know each other.	8(67)	4(33)	0
4. Sharing our favorite teachers was a way to talk about common interests with my student buddy.	4(33)	4(33)	4(33)
5. Talking about common activity interests (like Boy Scouts, Girl Scouts, sports) gave me conversation starters to use to model initiation with my student buddy.	9(75)	3(25)	0
6. When we shared books or movies we liked, it seemed to make it easier for my student buddy to talk with me.	7(58)	5(42)	0
7. Playing games together at recess helped me get to know my student buddy in a different way than I know the buddy in classes.	7(58)	5(42)	0

Table 20

Consumer Evaluation: Responses to the Follow-up on Effectiveness of Student Interest Survey

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I felt good as a peer buddy when my student buddy:

-began to like playing games with us
-played with me
-started talking with us
-smiled at me
-when I found out that he and I like some of the same things and food
-laughed a lot when she was with us
-came up to me first thing at recess and asked what I wanted to play
-looked me in the eye and seemed to listen to me when I talked to him
-when I found out she had been looking for me at recess on the day I was late for lunch
-talked to me after recess when we went back to the classroom
-ran up to me, and said "Hi!"
-when she laughed and smiled and said it was so fun

I think that I helped my student buddy in the following ways:

-she started asking other people to play our game with us
-he learned to answer questions and then ask me a question
-he now knows how to like other people and trust
-she doesn't always be alone at recess anymore
-she learned how to know how to start talking with people
-he was able to tell us about himself and the things that he likes to do
-she started asking actually seemed to listen to me
-he looked me in the eye
-she asked other people to play with her without me modeling it for her
-he doesn't think of me as a stranger anymore but a friend who likes to play wall-ball
-she looks at me when we talk now
-he knows that I will be a good friend now

Response to RQ3. Research Question Three examined how compatibility between the target student and peer trainer further vary the frequency of social interactions of students with HFA.

Responses of all student participants on the *Student Interest Survey* were utilized to match the target students with peer trainers. According to the *Follow-up to the Student Interest Survey,* the peer trainers' anonymous responses suggested that they found discussing the same favorite school subjects, activities, books and movies, special times with family, travel interests, favorite games, and sports and leisure activities all provided common ground on which to start and sustain conversation. In this way, the peer trainers believed they were able to know their target students better and enhance their peer-mediation.

Anonymous questions pertaining to the peer trainers' evaluation of their experience as social skills facilitators and their perception of success with the target students were met with positive comments about the benefits of the study for both of the participants.

Research Question 4: How does the training and experience in the study affect the quality of empathy in the peer trainers? All peer trainers were administered the *Student Questionnaire on Feelings* before the peer training sessions and one month after the intervention was completed (see Appendix J). This survey was created by the student investigator based on several questions from the *Empathy Questionnaire* or *EmQue-CA* designed by Rieffe, Ketelaar, and Wiefferink (2010), a standardized survey originally designed and written in Dutch. The newly created test for empathy contains 20 questions in a Likert-format.

The results of pre- and post- administrations of the empathy survey were compared for any differences. The number of peer trainers in this study was n =12, and so assumptions of distribution were not met for a parametric t-test pairing. The Wilcoxon Signed Ranks test, however, is a nonparametric test of paired data that accommodates very small samples and ordinal data, such as the properties of the data collected from this pre- and post-survey. Thus, the Wilcoxon Signed Rank test was conducted to determine the effect of the intervention on the peer trainers' empathy by comparing the before responses with those endorsed in the survey after the study. Little empathy was scored as 0, and high empathy was scored as 4, per the Likert responses.

This test of comparison indicated that the median score before the students were instructed to be peer trainers was 67.5, and following the training and their experiences in the intervention their median score was 71.3. This is a significant increase (z = -3.074, $p < .01$), indicating that the training and experience of facilitating social skills resulted in a measurable increase in empathy scores (see Table 21 and Figure 18).

Table 21

Wilcoxon Signed Ranks Test: Statistical Results of the Comparison of Responses on the Empathy Questionnaire Administered to the Peer Trainers Before and After the Intervention per SPSS Analysis

Wilcoxon Signed Ranks Test
a. post total < pre_total
b. post total > pre_total
c. post total = pre_total

z = -3.074, $p < .01$

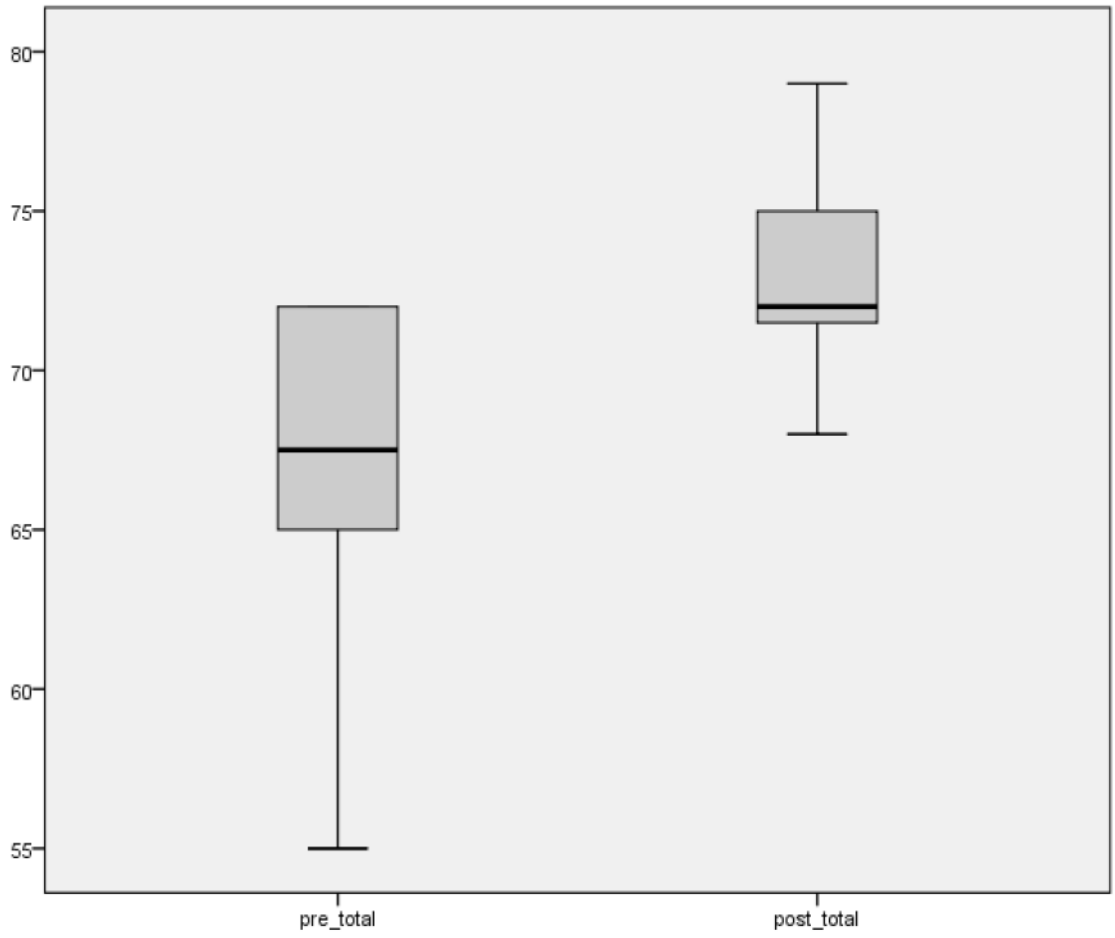

Figure 18. Pre- and post-responses on the empathy questionnaire.

The mid-line on both boxes represents the median or 50th percentile of responses. The top line on each box denotes that 75% of the values lie below, and the bottom line on each box denotes that 25% of the scores lie below. On both the pre-scores box and the post-scores box, the "whisker" line extending below represents the minimum values of the data set. On the post-survey total, the "whisker" line extending above represents the maximum number of values in the data set. No outliers were indicated on either the pre- or post-totals (outliners are represented by small circles on the graph).

Response to RQ4. Research Question 4 examined how the training and experience in the study affected the quality of empathy in the peer trainers. Comparison of

peer trainer pre- and post-responses on an empathy survey, the *Student Questionnaire on Feelings,* indicated an increase in empathy over the timeline of the study. A statistical analysis utilizing the Wilcoxon Signed Rank test indicated that the median score before the students were instructed to be peer trainers was 67.5, and following the training and their experiences in the intervention their median score was 71.3. The analysis of the difference between the two median scores revealed a significant increase, indicating that the peer training and experience of facilitating social skills in the target students resulted in a measurable increase in empathy scores.

Findings of the Study

The primary purpose of this study was to examine the effects on social interactions of students with HFA as a result of a peer-mediated social skills intervention conducted in a public school elementary setting. The study also allowed exploration of the possibility that such an evidence-based practice could supplement the current service delivery model of social skills training for this population of students in many public school settings in districts across the country that depend on pull-out models of social skills delivery. These models do not meet all four steps of evidence-based socials skills training (training, practice, generalization across settings and peers, and maintenance of learned skills) that recent research suggests are required for success (DiSalvo & Oswald, 2002; Kasari et al., 2012; Koegel et al., 2012).

According to Gresham, Elliott, and Kettler, (2010), students with HFA require explicit instruction around their respective social skill deficits, as well as opportunities to generalize newly learned skills. One of the advantages in utilizing peer trainers to explicitly model social skills is that target students may integrate more fully in their peer

group without adult interference (Battaglia & Radley, 2014). Thus, four target students with HFA were each assigned three typically developing peer trainers from their inclusive fourth grade classroom.

Social validity and consumer evaluation instruments were administered to the target students' parents, the recess duty teachers, and to the peer trainers. After peer trainers received six hours of instruction in inviting, initiating, responding, and modeling social interaction for their target students, a multiple baseline design was utilized to examine any change in social behaviors of the target students over four months during the school year. Five to six sessions of baseline were followed by a ten-week intervention phase in which peer trainers facilitated social skills with the target students twice a week during recess. Five weeks after the intervention phase, generalization probes were conducted in the lunchroom for two weeks, without the presence of the peer trainers, in order to examine any generalization across natural settings (the lunch room) and new peers. Treatment fidelity data and calculation of inter-observer agreement that met and/or exceeded expected benchmarks lent credibility to the results.

The first research question examined the effect, if any, of social skills mediation by the trained peers on the *frequency* of social interactions of elementary students with HFA. Overall, a functional relationship was observed between the social facilitation by the peer trainers and an increase in the target students' social responses, eye contact, and social initiations. The baselines of all four target students displayed stability in their low social interactions, yet, introduction of the interventions resulted in immediate change and an increase in social interaction. Four generalization probes (two per week for two weeks) in the cafeteria were taken five weeks after intervention ended without the peer

trainers present. Three of the four target students were observed to demonstrate eye contact, verbal responses, and social initiations in this new setting with other classmates at or above the average level of intervention during this last phase. One target student generalized somewhat in demonstrating eye contact but fell back to baseline level during observations of his verbal response and social initiations at lunch in the cafeteria.

The second research question examined the effect, if any, of social skills mediation by trained peers on the *quality* of social interaction of elementary students with HFA. Observer/coders utilized the technique of Momentary Time Sampling to code the social engagement behaviors every 15-second intervals per their timers (forty intervals of 15-seconds in each ten-minute observation). Any or all of the following behaviors could be coded: (a) three or more reciprocal exchanges; (b) walking with or sitting together with another student while talking; and (c) engaging in a game or activity for at least two minutes. At every beep, the observers immediately coded the behaviors occurring at that time. Quality was measured by the percentage of intervals out of the total 40 intervals in which coders observed one or more of the three social responses listed above. All of the target students responded immediately to the intervention in their display of social engagement behaviors. Three of the target students' engagements averaged over the 60 percent level during intervention, while a fourth target student engaged in social behaviors at an average of less than 30 percent throughout the intervention phase. With the exception of this same target student, all others continued to demonstrate observable social engagement throughout the generalization probes.

Recess duty staff from each school completed pre-, midway, and post-intervention social skills checklists on their target students, and the analysis of those results indicated a significant increase in perception of social skills over the timeline of the study. While not significant, the parents of the target students also completed the parent version of the checklist and their responses indicated an increase in their observations of their children's social skills over the timeline of the study.

The third research question examined whether or not matching the target students with peer trainers according to common interests could further affect the peer-mediation process in a positive way. Responses of all student participants on the *Student Interest Survey* were utilized to match the target students with peer trainers before the study began. According to the *Follow-up to the Student Interest Survey,* the peer trainers' anonymous responses suggested that they found discussing the same favorite school subjects, activities, books and movies, special times with family, travel interests, favorite games, and sports and leisure activities all provided common ground on which to start and sustain conversation. In this way, the peer trainers believed they were able to know their target students better and enhance their peer-mediation.

Anonymous questions on a survey pertaining to the peer trainers' evaluation of their experience as social skills facilitators and their perception of success with the target students received responses with positive comments about the benefits of the study for both of the participants.

The fourth research question explored whether or not the training and experience in the study affected the quality of empathy in the peer trainers. In order to determine if an increase in empathy was realized by the peer trainers over the timeline of the

intervention, the *Student Questionnaire on Feelings* was administered pre- and post-intervention. A statistical test of comparison indicated that the median score after the intervention was significantly greater than that before the students were instructed to be peer trainers. This significant increase indicated that the peer training and experience of facilitating social skills in the target students resulted in a significant increase in empathy scores over the timeline of the study.

Implications

Discussion of any issues during the intervention, as well as benefits and outcomes, will provide more detail about the effect the participant selection and interactions had on the findings of the study. It will also add background for further recommendations.

The results of this study relate to theoretical concepts of education in that many of the inherent issues, outcomes, and social interactions between the peer trainers and target students can be linked to social motivation theory, the social cognitive learning theory, and the concept of theory of mind that underlie the problem of practice.

Social cognitive theory posits that students learn through social interaction as they interpret the action of others and adapt their own actions based on others (Bandura, 1989). However, the target students with HFA in this study are at risk for inability to learn in this way, due to their lack of both focus and attention to social stimuli and imitation (Klin et al., 2003). For this reason, among others, these students require skill practice with typically developing peers across different naturalistic settings. For at least the last two years, the target students in this study have all received social skills training for thirty minutes per week in a small group setting with two to three other students demonstrating the same social challenges. In spite of that training history, they were

selected for the intervention due to their notable lack of social interaction with peers at recess. Their immediate individual responses to the delivery of peer-mediated social skills training suggest that they can be responsive to this treatment under the conditions stipulated during the study.

Baron-Cohen et al. (1985) described the Theory of Mind as the ability to attribute mental states to one's self and others while also understanding that one's thoughts differ from others. The theory of mind, then, suggests that one should be able to predict the actions and intentions of others. A consequence of impaired theory of mind in a student with HFA can be literal interpretation of what another student says, which may lead to erroneous social responses that can damage attempts at interpersonal connections. Training peers to be aware of these pitfalls for the target students allowed them to understand not to take seriously such social mistakes of their targets. This knowledge also helped them focus on incrementally breaking down their social modeling, as well as consistently narrating for the target student what they were doing and why.

Instruction of the peer trainers included these concepts and topics as well as how autism can be considered a matter of context blindness. It was essential for even the fourth-grade peer trainers of this study to understand that everything we say and do, and how we react and interact in our world, is based upon context (Vermuelen, 2012). Yet, context is a difficult concept for those with ASD to comprehend and one in which they often require specific training. According to Vygotsky (1978), the process of learning is uniquely social and occurs as children develop and interact with each other. Peer-mediated social skills facilitation capitalizes on this theory as the target student interacts,

while in the proximal zone of development, with the peer trainer who is more skillful, experienced, and successful in social interaction (Vygotsky, 1978).

Another theory related to autism and the outcomes of this study is that of the concept of social motivation. Syal and Finlay (2011) describe the theory as a possible factor in lack of social skills acquisition in those with autism. Since social motivation is considered to drive the need for acceptance and avoidance of peer rejection, while increasing attention to social cues, it would follow that diminished social motivation would result in a feedback loop of reduced social input that would then contribute to deficits in social cognition (Chevalier et al., 2012). This issue was suspected as a factor in the relatively lower social success of Target Student 3 in this study. As mentioned before, he often appeared to only tolerate the presence of his peer trainers, in spite of their flexibility and eagerness to interact with him. When he entered the generalization phase he continued to insist on sitting alone to eat lunch, a ritual that staff reported he has established over the last two years.

Overall, many benefits resulted for the participants of this study, which utilized peer-mediated intervention rather than direct adult involvement. Since classroom peers are often more appealing than adult trainers are to students, it makes sense to promote skill generalization through peer involvement and rotation among multiple peer trainers, while also providing opportunities to practice skills in naturalistic settings (DiSalvo & Oswald, 2002). Specifically trained, typically developing peers are much more likely to model age-appropriate social skills naturally, and peer trainers have been found to foster greater independence in their trainees than do adults working with students with HFA (Koegel et al., 2012). As noted in the literature review in Chapter 4, the presence of peer

trainers who are interested in playing with the students can also provide a halo effect, as esteem of those being trained are raised in the minds of classmates who observe how much fun the socially accepted peer trainers are having with the students with HFA (Kasari et al., 2012; Owen-DeSchryver et al., 2008). This phenomenon was observed twice in the study as both Target Student 2 and Target Student 4 met other students who wanted to join in with the play during intervention. These new friends were observed sitting with the target students during the generalization probes.

Matching three peer trainers to each target student was observed to be successful for the target students in that each threesome worked as a triad to support the target, as well as each other, as they attempted new strategies when one was not successful. They were also able to divide the responsibility of training across more than one individual. Research has shown that rotation among multiple peer trainers is important for successful social skills training in that it promotes maintenance and generalization (Harper et al., 2008). This "front-loading" method of offering multiple opportunities of peer-mediated generalization has been indicated to be very effective (Kamps et al., 2002). Using more than one peer trainer may provide exposure to a range of skill and motivation levels for the student with ASD, and observing social skills of several different peers may assist students with HFA to be more active participants (Carter et al., 2005; Kasari et al., 2012).

Benefits for the peer trainers included an increase in empathy, understanding, and tolerance for differences as they worked with their classmates with HFA. Mentoring can also promote leadership skills, as well as a sense of responsibility (Carter et al., 2005). In addition to their positive responses on the consumer evaluation surveys, many

of the peer trainers, as well as their parents, reported that it was a fulfilling experience, noting that it made them feel useful to have a positive impact on someone's life.

The target students in this study were divided equally by gender with 50% female and 50% male. According to Lai et al. (2015), most autism studies have historically tended to include participants based on currently accepted statistics of a greater ratio of autism diagnosed in boys than girls, or they opt to include only males in a study.

Some of the issues associated with conducting an intervention at recess in a school rather than in a clinical setting include environmental circumstances and interruptions, such as fire drills, snowy and icy weather, schedule changes that affect the recess venue, or even illness of students. These conditions can influence the effectiveness of such an intervention. As noted in the results section, social interaction visibly fluctuated on several of the graphs when students were sick, or even when downpours on the playground occurred, making it necessary to run under cover and return to the classroom.

There are always ethical concerns in a multiple-baseline design across subjects, in that after treatment begins for the first participant, it will be delayed for the other(s). Even when data indicates that the second student eventually received benefit from the treatment, the staggering of the first and next require that the last student wait while the first participant is already benefiting from the treatment (Kazdin, 2011).

As noted in the results of peer implementation fidelity, one of Target Student 1's peer trainers was easily distracted by other students who urged her to leave the study and join them. Her teacher, the counselor, and her mother met together with her to discuss

the reasons why they thought she would regret leaving (e.g., making a commitment and sticking to it, showing leadership skills). She made the decision to continue until the end of the study. In spite of this issue, Target Student 1 responded very well to the peer-mediated intervention provided to her during the study, which may have been partly the result of having multiple peer trainers available rather than just one. Staff and her parents described the target student as quite socially naïve and they doubted that she picked up on Peer Trainer 2's distraction. However, this issue suggests the need for a more thorough selection process. Although the teacher and counselor made strong recommendations for this peer trainer based on her leadership qualifications, it may be advisable for future researchers to delve deeper into the peer pressure susceptibility of the peer trainer candidates.

Collection of inter-observer data indicated that the coders observing eye contact, as well as verbal responses, did not always coincide in their observations. Discussion with the observers suggested that their need to be unobtrusive and apart from the students' fast-moving games, yet close enough to the target student to discern some social behaviors, made it difficult for them. After discussion about this issue, the observers made adjustments in their positions. In spite of this issue, all observation totals of the four target students, as well as observations totals of the separate social behaviors met or exceeded benchmark.

The responses on the parents' Social Responsiveness Scale-Second Edition (SRS-2) indicated an increase in their observations of social impairments in their students between the pre-administration and the administration midway through the intervention. Although the last administration during the post-ratings suggested

perception of less severe social impairments, the change was not significant. Expectation of a higher and more immediate level of behavior change in their children at home due to participation in the study may have contributed to the ratings. Another factor to consider when examining these results is that three out of four of the target students were only children, with possibly no social comparison at home available for their parents. The only student who was rated more favorably by his parents has three siblings, and his mother is a teacher in another district, with presumably more daily observations of diverse social skills available to her in her classroom. In contrast with the three sets of parents who rated their students' social skills as much less improved than did their teachers, recess duty staff rated significant changes over the study. It is possible that because they were able to reference the numerous comparisons of social interactions observed each day at recess, they had different expectations of students at play. Overall, however, the results of administration of the checklists provided social validity throughout the timeline of the study .

Attempts to Control Internal and External Validity

Evidence-based practice assumes that an intervention is being implemented fully as detailed. This is particularly important given the greater potential for inconsistencies when implementing a study in a school setting rather than clinical conditions (Mihalic, 2004). For this reason, data on the implementation of fidelity of the instruction of the peers was an important component of the study, as were monitoring the implementation of the peer trainers in skills facilitation and recording inter-observer agreement between pairs of adult coders.

Internal validity refers to how well a study is designed so as to allow a causal relation to be inferred. Threats to internal validity can suggest alternative explanations for any association of dependent and independent variables in a study (Shadish, Cook, & Campbell, 2002).

A well designed single-subject study and strength in selecting participants can reduce history, maturation, testing, instrumentation, and statistical regression issues (Campbell & Stanley, 1966). Measurement was steady in this particular study, and there were no tests administered to the target students. The threat of statistical regression was reduced by the target student selection process. Selection biases could be ruled out in this multiple baseline design as the target students were compared with themselves under different conditions. Attrition can also be a potent threat in single-subject studies, in that it can change the treatment (Horner, et al., 2005). This study attempted to neutralize this potential limitation by having an available pool of pre-selected target students, as well as two extra peer trainers who attended instruction sessions, in case of a need for substitution. Fortunately, all peer trainers and target students remained in the study throughout all phases, thus, no substitution was necessary. Diffusion of treatment was not a threat as there were no peer trainers present during the baseline phase.

External validity refers to the generalizability of the findings beyond the experimental context (Shadish et al., 2002). Threats to external validity can limit the generalizability of the study to other persons, settings, treatments, or outcomes (Campbell & Stanley, 1966). The external validity of multiple-baseline studies can be limited when care is not taken in selecting participants (Shadish et al., 2002). All possible attempts were made in this study to follow pre-established criteria for

recruitment and selection of all participants.

According to Shadish et al. (2002), interpreting the effect of a treatment can be difficult if the baseline phase shows excessive variability or increasing or decreasing trends in behavior but this was not the case in this study. Interactions among the treatments can also be potentially threatening to generalizability of a study, and Campbell and Stanley (1966) referred to these interactions as 'reactive arrangements'. Concern about multiple treatment interference was neutralized by a criteria item for target student selection that the students not currently receive social skills therapy outside of the school.

Due to the familiarity of participants in this study, since they all attended the same school, there could have been pre-existing chemistry (negative or positive) between the specific target students and their peer trainers that could have affected the strength of the peer mediation process and might not occur in another study. This interaction may influence outcomes in that the physical presence of the specific peer trainer mediates the outcome, rather than the treatment (peer facilitation) being the cause of the outcome. A compatibility match to counter a negative affect, as well as rotation among the three peer trainers, were strategies used to neutralize such a threat.

If a participant is aware of the possible outcomes of a study, it can be difficult to ascertain if the results are measures of effect of the treatment or that which the participant perceives should be the outcome (Shadish et al., 2002). For this reason, the target participants were not aware of the purpose of treatment and their parents were asked not to divulge it until after the study. Peer trainers were also unaware of who their target student would be until the first day of the intervention phase.

Conducting this recess intervention with peer trainers from each target student's class within their school setting was an attempt to increase generalizability of the results by designing a study as realistic as possible. Similarly, the age and grade difference among all of the student participants was negligible to maintain more uniformity.

Limitations

Limitations exist in all research in spite of the investigator's attempts to neutralize threats to generalization (Kazdin, 2011). As in all single-case designs, a small sample makes it difficult to generalize to larger populations. Most previous peer-mediated research has been conducted in controlled clinical settings, which does not typically lend to generalization into a school setting. However, there are variations in size, culture, and schedules among schools that could also affect generalization of this specific study to another elementary school. Whether results from this study may be generalized can also depend on the variability within the population from which the case was selected as some characteristics vary more across individuals than others (Shadish et al., 2002).

Since this study was conducted in the naturalistic setting of recess over three months, the activities and games that the target students and their peer trainers played were typical for fourth-grade children, but not necessarily controlled for by the student investigator. Several games appeared to be more motivating to some than to others, which could have affected the responses of each target student.

An additional limitation in this study was that, although there were generalization probes in a different setting (lunch) without peer trainers present, they were only conducted four times within two weeks. This is another common obstacle in a

school setting due to the relatively short window for continuous, uninterrupted interventions due to the holiday breaks throughout the year.

Future Direction for Research in School Settings

Although there have been clinical interventions and university research studies demonstrating the need for social skills training that includes maintenance and generalization phases with typically developing peers within a social skills training model, very few public schools have followed through with these last two stages (Rogers, 2000; McFadden et al., 2014; Williams-White et al., 2007). Selecting target behaviors and teaching students with HFA in the environment in which they are to be used makes it more likely that they will be controlled by naturally occurring stimuli following the withdrawal of intervention, thus facilitating maintenance (Stokes & Baer, 1977).

This study contributes to peer-mediated social skills research in a public school setting as it included participants in two elementary schools as implementers of training for target students. Thus, it will be a beneficial reference for similar future studies that are implemented in schools rather than clinical settings.

One of the limitations cited for this study was the lack of control of the student researcher over the games that were played during intervention. Some of them, such as wall-ball, often required students to stand in the line awaiting their turn for quite a while, depending on how many students were interested in playing that day. Other games, such as Simon Says and Statues, required that students follow directions without speaking and so affected the observations and coding of verbal initiations and responses. Future peer-mediated recess studies of this young age could seek to control the nature of games played during which the students are observed.

Although this study included generalization probes that were conducted five weeks after the end of the intervention phase, it would be beneficial for future research in this area to examine maintenance of social skills before the term is over. It would be important to collect data on the generalization and maintenance within the same school year to avoid complications that might arise from other variables during the eight to ten week summer break.

Ensuring the quality of implementation of procedures and adherence to the intent of the study are both essential for any future research in the area and should be carried out through strict data collection of treatment fidelity and inter-observer agreement. Only with this information can researchers have confidence in their results.

Future Direction for School Practitioners

In the opinion of the student investigator, fourth grade was an optimal year to conduct this social skills implementation as the target students have another year to practice the social interactions they learned before moving on to middle school, an environment which is inherently wrought with numerous new social challenges. This study also selected peer trainers from the same classrooms that the target students attended, making it more likely that some of those interactions and modeling could transfer from the playground to the classroom. The teacher of one of the target students in this study also capitalized on the recess intervention and rotated a peer trainer every three weeks at the table where the target student sat so that they could be on a collaboration team together.

Utilizing three peer trainers per one target student provided more opportunities for generalization across different partners during the study. It also increased

opportunities for peer modeling examples for the target students. At the least, the number of peer trainers assigned to each target student should be three.

Although there have been social skills interventions conducted within the classroom, recess is the ideal setting for such an intervention because it is social in nature, and strongly promotes generalization (Harper et al., 2008). Interventions at lunch would be the next best thing, but also worked well as a generalization setting for this current study.

This researcher found that the compatibility match was successful in providing common interests on which to build conversations between the peer trainers and target students. If, by chance, there is not a tight match between a target student and one of the peer trainers, the remaining two are available to intensify their efforts. The peer trainers also responded positively about the matching while completing the consumer evaluation survey. In addition, they commented that the process of taking the consumer evaluation survey was insightful in that listing their observations helped them to reflect on all of the benefits they felt the study provided for them, as well as for the target students.

Because there is usually concern on the part of parents that their peer trainers will have less time to play with their own friends, it will be necessary to emphasize that ten minutes is the maximum time per session. For the same reason, it is always important to conduct no more than two sessions a week.

In selecting the peer trainers, it would be useful to investigate whether or not they are susceptible to peer pressure from others in order to avoid attrition in the study due to dropout. The teachers, principal, and counselors who assisted in nominating the peer trainers for this study were surprised when the one peer trainer considered leaving.

Although they viewed her as a strong leader in the school, they had not been aware of some of the peers to whom she was attracted that were making negative comments about her target student. It would have been beneficial to interview the recess duty teachers before the final selection process.

Target Student 3 was also nominated for the study because he met the criteria of a student with HFA. However, he demonstrated little social motivation to initiate verbally or socially and observations of him during the generalization phase fell close to, or below, baseline level. The Speech Language Pathologist (SLP) and his teacher were two of those who nominated him. The SLP worked with him during the 30 minutes per week of pull-out social skills training and had never observed him on the playground or at lunch. Similarly, his teacher had observed him in few settings other than the classroom, which he navigated well in the academic arena. The recess duty teacher, however, was not surprised at his relatively lower response to the peer-mediation as she had observed his social avoidance in several settings. Her observations on the SRS-2 rating of Target Student 3 in the area of social motivation fell within the severe impairment range not only on the mid-, and post-administrations, but on the pre-checklist, as well. Thus, future studies should include as much anecdotal information as possible about all of the participants, in addition to the selection and nomination criteria.

Social validity is an essential component of a study like this one in that it allows for parents and school staff who interact with the target students daily to be a part of the study as they can share their perspectives over the timeline. Consumer evaluation surveys administered to the peer trainers should be anonymous. Hurley (2012) notes that

although several previous peer-mediation studies have utilized consumer surveys using open-ended questions, without anonymity, credibility of responses can be questionable.

Social skills training with this model that includes teaching peers to model and initiate social interaction could also address any shortage of staff as progress monitoring could be effectively provided by special education staff for short periods of time after completion of peer training, using some of the time that is currently allocated for pull-out training (Chan et al., 2009). It would require staff time to select and instruct peer trainers, as well as to monitor ongoing progress of the model, but once it was begun, rotation of different staff in a supervisory role once or twice a week could be implemented. Funding for such an evidence-based program might be received favorably by local and national autism agencies as well as non-governmental agencies (NGOs) in the district's community.

District goals of increasing student achievement, social competence, safety, and well-being are embedded in this project, thus, making it more appealing to all district stakeholders including students, parents, community, school board members, teachers and staff, and administrators at all levels (McFadden, 2013). More importantly, such a study could lend community support and credibility to the need for more applied research in public school settings in the area of social skills training for students with HFA. An increase in human and social capital for this population would be the long-term outcome.

Conclusion

This study examined the effectiveness of a peer-mediated social skills intervention for students with HFA in a public school setting. This model provided

opportunities for generalization and maintenance of the newly learned skills across different settings and peers.

Overall, a functional relationship was observed between the social facilitation of the peer trainers and the increase in the target students' social responses, eye contact, initiations, and overall social engagement. The baselines of all four target students displayed stability in their low social interactions, yet, introduction of the interventions resulted in immediate change and an increase in social interaction. Additionally, procedural fidelity checks and intra-observer agreement lent credibility to the results. Compatibility matching of peer trainers with target students provided more opportunities for generalization across different partners during the study, as well as increased opportunities for peer modeling examples for the target students. Social responsiveness ratings of the target students by parents and recess duty staff provided social validity measures from home and school. Peer trainers also completed anonymous consumer evaluation surveys that allowed them to reflect on the positive impacts of the study on the target students, as well as on their own growth through the process. Pre- and post-tests administered to the peer trainers before and after the study also indicated an increase in empathy over the timeline of the study.

A secondary purpose of the study was to explore whether this model would be appropriate to supplement the social skills training that these students typically receive for only 30 minutes a week in a pull-out model with students who share the same social deficits. Based on the literature review, as well as the results of this recent intervention in one large suburban school district, success of a four-step comprehensive social skills training program in the elementary setting could be quite possible, and is recommended.

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Appendix A

Teacher and Parent Consent Form for Needs Assessment

Johns Hopkins University

Homewood Institutional Review Board (HIRB)

Parent and Teacher Informed Consent

Title: Social Skills Training for Students on the Autism Spectrum in General Education Settings: A Needs Assessment of the Current Model of Service Delivery in the Elementary School

Principal Investigator: Kathleen Wilson

Date: April 3, 2015

PURPOSE OF RESEARCH STUDY:

The purpose of this research questionnaire is to survey the perceived needs of the current service delivery model of social skills training to elementary students on the autism spectrum who are in general education settings.
The survey is anticipated to be distributed by email to approximately 40 teachers and 40 parents over a one-week period.

PROCEDURES:

You will be asked to participate in this study one time within the school year by, at the minimum, completing a questionnaire that will be sent to you via email. You will need to allow 10-20 minutes to complete the questionnaire.

RISKS/DISCOMFORTS:

There are no anticipated risks to respondents.

BENEFITS:

Potential benefits include an increased understanding of the needs of the current service delivery model under which high-functioning students on the autism spectrum in general education settings receive social skills training. This survey will collect data from the students' teachers and parents about their perception of need for a service delivery model that is similar to the current model or one that differs from the current model, according to the level that students' social skills needs are currently met.

CONFIDENTIALITY:

Any study records that identify you will be kept confidential to the extent possible by law. The records from your participation may be reviewed by people responsible for making sure that research is done properly, including members of the Johns Hopkins University Homewood Institutional Review Board and officials from government agencies such as the Office for Human Research Protections. (All of these people are required to keep your identity confidential.) Otherwise, records that identify you will be available only to people working on the study, unless you give permission for other people to see the records. All videotapes and measures will be examined by the

Principal Investigator and research affiliates only (including those entities described above). No identifiable information will be included in any reports of the research published or provided to school administration. A participant number will be assigned to all of the surveys, will be collected in either electronic or paper format. Survey data completed electronically will be collected via a password protected Google.Docs Forms account that belongs to JHU School of Education. If you are unable to complete the surveys electronically, paper copies will be provided. In both electronic and paper format, these data will not include identifiable information. Video data of focus group interactions may be transcribed by an outside agent (transcriptionist), who will de-identify all transcripts by deleting all names from the transcript and only a participant number or pseudonym will be included on these transcripts.

All research data including paper surveys and videotapes will be kept in a locked office. Electronic data will be stored on the PI's computer, which is password protected. Any original tapes or electronic files will be erased and paper documents shredded, ten years after collection. Only group data will be included in publication.

COMPENSATION:
You will not receive any payment or other compensation for participating in this study.

IF YOU HAVE QUESTIONS OR CONCERNS:
You can ask questions about this research study at any time during the study by contacting Dr. Christine W. Eith via phone or email: (410) 516-7953, ceith@jhu.edu.
If you have questions about your rights as a research participant or feel that you have not been treated fairly, please call the Homewood Institutional Review Board at Johns Hopkins University at (410) 516-6580.

SIGNATURES:
WHAT YOUR SIGNATURE MEANS:
Your signature below means that you understand the information in this consent form.
Your signature also means that you agree to participate in the study.
Your signature indicates that you agree to participate in the study.
By signing this consent form, you have not waived any legal rights you otherwise would have as a participant in a research study.

Signature of Parent _____Date_____

Signature of Teacher_____Date_____

Signature of Person Obtaining Consent_____Date_____
(Investigator or HIRB-Approved Designee

Appendix B

Teacher Needs Assessment Survey

April 20, 2015

Dear Teacher,
The purpose of this survey is to collect data from teachers currently working with general education students who meet special education eligibility criteria under the designation of Autism Spectrum Disorders (ASD) and, thus, receive specially designed instruction (SDI) in social skills from a speech language pathologist or school psychologist. As you are aware, unlike their neurotypical peers, high-functioning individuals on the autism spectrum in inclusive settings don't necessarily absorb and imitate social skills, but often need to "learn" the skills through specifically designed social skills instruction, followed by generalization in natural settings across time. Although the process takes time and effort, provision of opportunities for social skills training, maintenance, and generalization can result in a positive lifetime impact on a student's social interpersonal skills, vocational success, and personal satisfaction.

As specialists who provide social skills training per your students' Individual Education Plans (IEPs), our team strives to provide instruction at a professional level that will lead to development of social competence. We appreciate your candor in competing this short survey as we are interested to know your opinions and concerns about the present service delivery model and any needs that you do not feel are currently being met. The information you share will assist staff in making future decisions about this area of instruction. Once again, be assured that the confidentiality of the survey participants is guaranteed, as noted in the informed consent you signed before receiving this survey. Your participation in this needs assessment is so appreciated.

GO to next page to begin survey...

---

page 2 of 7

YOUR SATISFACTION WITH THE CURRENT STATE OF TRAINING

"Training" refers to social skills training that is delivered by a specialist weekly as written in an Individual Education Plan (IEP):

1. In your opinion, how successful has the current delivery service of social skills training at school been for your student(s)? *Scale of 1 (Inadequate) to 5 (More than Adequate) (This is presented as a scale on Google Forms)*

Inadequate X_____X_____X_____X_____X *More than Adequate*

2. How well do you think the current social skills training at school has led to improvement in your student(s) in the following areas? *Mark all that apply*:

__ Improved eye contact with others
__ Increased initiation of social interactions
__ Increased understanding of emotions and how they are expressed
__ Improved ability to carry on reciprocal conversations with others
__ Improved personal awareness of others' space
__ Improved ability to inhibit oneself from interrupting and talking over others
__ Decreased literal interpretation of nonliteral language, such as figures of speech, metaphors, and sarcasm

DO YOU PERCEIVE A NEED FOR CHANGE IN THE CURRENT MODEL OF SOCIAL SKILLS TRAINING?

3. Do you believe that the current service delivery model of social skills training adequately meets the needs of your student?

__ YES (this answer automatically sends respondent to page 6)
__ NO
__ SOMEWHAT

4. If you answered NO or SOMEWHAT to the last question, in what area(s) do you feel the current model of social skills training has not met the needs of your student? *Mark all that apply*:

__ The current model of service delivery is not adequate in time allotted for initial training of necessary social skills

__ The current model of service delivery would benefit from more time for maintenance of the skills that have been learned with a specialist

__ The current model of service delivery would benefit from more time to generalize those learned social skills in other natural settings (e.g., recess and lunch)

POSSIBLE FACTORS RELATED TO INADEQUACIES IN THE CURRENT SOCIAL SKILLS TRAINING PROGRAM

5. Which of the following do you consider to be causes and contributing factors to the inadequacies of the current model of social skills delivery in your school? *Mark all that apply*:

__ Time availability for initial social skills training with a specialist (i.e., service time on IEP)
__ Time availability for social skills maintenance in general education classrooms
__ Time availability to generalize taught skills in natural settings such as recess and lunch
__ Staff availability for social skills maintenance
__ Staff availability for skill generalization in natural settings
__ Other: _____

6. Based on the questions above, how difficult do you think it would be to change time availability for social skills training with a specialist? *Scale of 1 (Not Very Difficult) to 5 (Very Difficult)*

Not Very Difficult X_____X_____X_____X_____X *Very Difficult*

7. How difficult do you think it would be to change time availability for social skills maintenance in general education classrooms? Scale of 1 (Not Very Difficult) to 5 (Very Difficult)

Not Very Difficult X_____X_____X_____X_____X Very Difficult

8. How difficult do you think it would be to change time availability for staff to generalize taught social skills in natural settings such as recess and lunch? *Scale of 1 (Not Very Difficult) to 5 (Very Difficult)*

Not Very Difficult X_____X_____X_____X_____X *Very Difficult*

_____
__

PERCEIVED RISK OF CONSEQUENCES WITHOUT SOME MODIFICATION

9. If the service delivery model of social skills training in your school remains within the current state, how seriously do you rate the risk for your student(s)' development in social competence? Scale of 1 (Not Very Serious) to 5 (Very Serious)

Not Very Serious X_____X_____X_____X_____X Very Serious

Optional Comments on Above Question:_____

10. How difficult do you perceive it would be for the school to address what you see as inadequate social skills training needs in your school? *Scale of 1 (Not Too Difficult) to 5 (Very Difficult)*

Not Too Difficult X_____X_____X_____X_____X *Very Difficult*

*Optional Comments on Above Question:*_____

_____

page 6 of 7

We would appreciate your responses to the following questions about your student(s)' experience with outside social skills training.

11. Has your child ever received services outside of school (e.g., in a clinical setting, in a social skills group, in Applied Behavior Analysis, etc.) in social skills training?
__YES
__NO

12. If you answered YES to the above question, does he/she **currently** receive outside social skills services?
__YES

__NO

OTHER:_____

13. If you answered YES to one or both of the questions above, did you feel the results of the outside training were more successful than social skills trainings in the school setting?
__YES

__NO

14. If you answered YES to the last question, what elements of outside social skills training made it most successful in comparison with the training provided at school?
(ANSWER IN TEXT BOX PROVIDED BELOW)

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Please share your opinions on this issue.

15. If you could choose three priority skills necessary for social competence in the elementary school, what would they be? (ANSWER IN TEXT BOX PROVIDED BELOW)

16. What improvements overall can you suggest for the current social skills training of your student in school?
(ANSWER IN TEXT BOX PROVIDED BELOW)

17. What are some of the barriers you face as a parent at home in following through with the social skills training your student receives with a specialist?
(ANSWER IN TEXT BOX PROVIDED BELOW)

THANK YOU SO MUCH FOR TAKING THE TIME TO RESPOND TO THIS SURVEY. THE INFORMATION YOU HAVE SHARED WILL ASSIST STAFF IN MAKING FUTURE DECISIONS ABOUT THIS AREA OF INSTRUCTION.

- **SEND FORM NOW**
- **EDIT FIRST AND THEN SEND FORM**

Appendix C

Parent Needs Assessment Survey

April 20, 2015
Dear Parent,
The purpose of this survey is to collect data from parents of students in general education that meet special education eligibility criteria under the designation of Autism Spectrum Disorders (ASD) and, thus, receive specially designed instruction (SDI) in social skills from a speech language pathologist or school psychologist. As you are aware, unlike their neurotypical peers, high-functioning individuals on the autism spectrum in inclusive settings don't necessarily absorb and imitate social skills, but often need to "learn" the skills through specifically designed social skills instruction, followed by generalization in natural settings across time. Although the process takes time and effort, provision of opportunities for social skills training, maintenance, and generalization can result in a positive lifetime impact on a student's social interpersonal skills, vocational success, and personal satisfaction.

As specialists who provide social skills training per your student's Individual Education Plans (IEPs), our team strives to provide instruction at a professional level that will lead to development of social competence. We appreciate your candor in completing this short survey as we are interested to know your opinions and concerns about the present service delivery model and any needs that you do not feel are currently being met. The information you share will assist staff in making future decisions about this area of instruction. Once again, be assured that the confidentiality of the survey participants is guaranteed, as noted in the informed consent you signed before receiving this survey. Your participation in this needs assessment is so appreciated.

GO to next page to begin survey...

---

page 2 of 7

YOUR SATISFACTION WITH THE CURRENT STATE OF TRAINING

"Training" refers to social skills training that is delivered by a specialist weekly as written in an Individual Education Plan (IEP):

1. In your opinion, how successful has the current delivery service of social skills training at school been for your student? *Scale of 1 (Inadequate) to 5 (More than Adequate)*

Inadequate X_____X_____X_____X_____X *More than Adequate*

2. How well do you think the current social skills training at school has led to improvement in your student within the following areas? ***Mark all that apply***:

__ Improved eye contact with others
__ Increased initiation of social interactions
__ Increased understanding of emotions and how they are expressed
__ Improved ability to carry on reciprocal conversations with others
__ Improved personal awareness of others' space
__ Improved ability to inhibit oneself from interrupting and talking over others
__ Decreased literal interpretation of nonliteral language, such as figures of speech, metaphors, and sarcasm

DO YOU PERCEIVE A NEED FOR CHANGE IN THE CURRENT MODEL OF SOCIAL SKILLS TRAINING?

3. Do you believe that the current service delivery model of social skills training adequately meets the needs of your student?

__ YES (this answer automatically sends respondent to page 6)
__ NO
__ SOMEWHAT

4. If you answered NO or SOMEWHAT to the last question, in what area(s) do you feel the current model of social skills training has not met the needs of your student? ***Mark all that apply***:

__ The current model of service delivery is not adequate in time allotted for initial training of necessary social skills

__ The current model of service delivery would benefit from more time for maintenance of the skills that have been learned with a specialist

__ The current model of service delivery would benefit from more time to generalize those learned social skills in other natural settings (e.g., recess and lunch)

POSSIBLE FACTORS RELATED TO INADEQUACIES IN THE CURRENT SOCIAL SKILLS TRAINING PROGRAM

5. Which of the following do you consider to be causes and contributing factors to the inadequacies of the current model of social skills delivery in your school? *Mark all that apply*:

__ Time availability for initial social skills training with a specialist (i.e., service time on IEP)
__ Time availability for social skills maintenance in general education classrooms
__ Time availability to generalize taught skills in natural settings such as recess and lunch
__ Staff availability for social skills maintenance
__ Staff availability for skill generalization in natural settings
__ Other: _____

6. Based on the questions above, how difficult do you think it would be to change time availability for social skills training with a specialist? *Scale of 1 (Not Very Difficult) to 5 (Very Difficult)*

Not Very Difficult X_____X_____X_____X_____X *Very Difficult*

7. How difficult do you think it would be to change time availability for social skills maintenance in general education classrooms? *Scale of 1 (Not Very Difficult) to 5 (Very Difficult)*

Not Very Difficult X_____X_____X_____X_____X *Very Difficult*

8. How difficult do you think it would be to change time availability for staff to generalize taught social skills in natural settings such as recess and lunch? *Scale of 1 (Not Very Difficult) to 5 (Very Difficult)*

Not Very Difficult X_____X_____X_____X_____X *Very Difficult*

PERCEIVED RISK OF CONSEQUENCES WITHOUT SOME MODIFICATION

9. If the service delivery model of social skills training in your school remains within the current state, how seriously do you rate the risk for your student's development in social competence? *Scale of 1 (Not Very Serious) to 5 (Very Serious)*

Not Very Serious X_____X_____X_____X_____X *Very Serious*

*Optional Comments on Above Question:*_____

10. How difficult do you perceive it would be for the school to address what you see as inadequate social skills training needs in your school? *Scale of 1 (Not Too Difficult) to 5 (Very Difficult)*

Not Too Difficult X_____X_____X_____X_____X *Very Difficult*

*Optional Comments on Above Question:*_____

_____

page 6 of 7

We would appreciate your responses to the following questions about your student(s)' experience with outside social skills training.

11. Has your child ever received services outside of school (e.g., in a clinical setting, in a social skills group, in Applied Behavior Analysis, etc.) in social skills training?

__YES

__NO

12. If you answered YES to the above question, does he/she **currently** receive outside social skills services?

__YES

__NO
OTHER:_____
___

13. If you answered YES to one or both of the questions above, did you feel the results of the outside training were more successful than social skills trainings in the school setting?

__YES
__NO

14. If you answered YES to the last question, what elements of outside social skills training made it most successful in comparison with the training provided at school?
(ANSWER IN TEXT BOX PROVIDED BELOW)

page 7of 7

Please share your opinions on this issue.

15. If you could choose three priority skills necessary for social competence in the elementary school, what would they be? (ANSWER IN TEXT BOX PROVIDED BELOW)

16. What improvements overall can you suggest for the current social skills training of your student in school?
(ANSWER IN TEXT BOX PROVIDED BELOW)

17. What are some of the barriers you face as a parent at home in following through with the social skills training your student receives with a specialist?

(ANSWER IN TEXT BOX PROVIDED BELOW)

THANK YOU SO MUCH FOR TAKING THE TIME TO RESPOND TO THIS SURVEY. THE INFORMATION YOU HAVE SHARED WILL ASSIST STAFF IN MAKING FUTURE DECISIONS ABOUT THIS AREA OF INSTRUCTION.

- **SEND FORM NOW**

- **EDIT FIRST AND THEN SEND FORM**

Appendix D

Consent Forms for Intervention

Johns Hopkins University

Homewood Institutional Review Board (HIRB)

Parental Permission Form

Title:	Peer-mediated Social Skills Training
Principal Investigator:	Dr. Patricia Hershfeldt, Johns Hopkins University
Date:	December 2, 2016

PURPOSE OF THE RESEARCH STUDY:

The purpose of this research study is to investigate the impact of peer-mediation at recess on the generalization and maintenance of learned social skills for elementary students with high-functioning autism. We anticipate that approximately 16 children of both genders will participate in this study across two research sites within your child's school district.

PROCEDURES:

The study will include four sets of participants:

- Peer Trainers: Prior to the intervention, peer trainers will receive six hours of training by this researcher, utilizing a Peer Buddy curriculum. The training sessions will include explicit instruction on strategies to facilitate social interactions by the target students. In each session, instruction will be followed by rehearsal and practice through role-play and a summary of questions and answers. During the training, the peer trainers will also complete a survey about friendship, and will complete another short survey following the intervention about strategies that best worked with the target students. Three peer trainers will be assigned to each of the target students, and will employ the strategies they have learned during their training sessions through peer involvement and rotation among themselves when they join their target students. The peer trainers will participate in the study during a 20-minute recess twice a week for 10 weeks during the intervention.
- Target Students: Target students will be selected elementary students with high-functioning autism in general education who will receive modeling and coaching of appropriate social interactions at recess by the peer trainers. Prior to the intervention and at its completion, the target students will take a pre- and post-friendship survey. Target students will be observed for six recess sessions without any peer trainers during the baseline data collection. The peer trainers will interact with the target students during two recesses a week for the 10 weeks of intervention. The target students will then be in the same proximity as the peer trainers after the intervention but the peer trainers will not be coaching or prompting the target students to socially interact. During this time, the target students will be observed and data will be collected on their independent social initiation and responses.
- Parents: Parents of the target students will complete a social skills inventory before and after the intervention in order to document any perceived changes in social skills of their child over the timeline of the study, each of which will take a maximum of 20 minutes.
- Recess Staff: Two recess staff members who monitor the playground during the

two recesses per week during the intervention will complete a social skills inventory before and after the intervention in order to document any perceived changes in social skills of the target students over the timeline of the study, per their observations.

RISKS/DISCOMFORTS:

The risks associated with participation in this study are no greater than those encountered in daily life.

BENEFITS:

- Benefits for the target students in this study will include exposure to appropriate modeling of social interactions by typically developing peers. Classroom peers are often more appealing to students than adult trainers and better able to promote skill generalization, while also providing opportunities to practice skills in naturalistic settings. Thus, specifically trained, typically developing peers are much more likely to model age-appropriate social skills naturally than adults; peer trainers will also be able to foster greater independence in their trainees than do adults working with the target students. The presence of peer trainers who are interested in playing with the students on the spectrum may also encourage other classmates not involved in the study to join in play with the target students.

- Throughout the training, as well as during the intervention, peer trainers can benefit from an increase in empathy, understanding, and tolerance for differences as they work with students with high-functioning autism. Overall, mentoring as a peer buddy will provide promotion of and development of leadership skills, as well as a sense of responsibility. Mentoring can be fulfilling in that it provides a chance to make a positive impact on someone's life.

VOLUNTARY PARTICIPATION AND RIGHT TO WITHDRAW:

Your child's participation in this study is entirely voluntary: You choose whether to allow your child to participate, and we will also ask your child whether he or she agrees to take part in the study. If you decide not to allow your child to participate, or your child chooses not to participate, there are no penalties, and neither you nor your child will lose any benefits to which you would otherwise be entitled.

If you and your child choose to participate in the study, you or your child can stop participation at any time, without any penalty or loss of benefits. If you want to withdraw your child from the study, or your child wants to stop participating, please contact the researcher, Kathleen Wilson, at 503-860-6008. If we learn any new information during the study that could affect whether you or your child want to continue participating, we will discuss this information with you and your child.

CONFIDENTIALITY:

Any study records that identify you or your child will be kept confidential to the extent possible by law. The records from your child's participation may be reviewed by people responsible for making sure that research is done properly, including members of the Johns Hopkins University Homewood Institutional Review Board and officials from government agencies such as the National Institutes of Health and the Office for Human Research Protections. (All of these people are required to keep your identity and the identify of your child confidential.) Otherwise, records that identify you or your child will be available only to people working on the study, unless you give permission for other people to see the records.

All study records will be created, stored and maintained to protest confidential information. Code numbers will be used instead of participants' names on data sheets and records will be kept in a locked file cabinet with sole access by the researcher.

COMPENSATION:

You and your child will not receive any payment or other compensation for participating in this study.

IF YOU HAVE QUESTIONS OR CONCERNS:

You and your child can ask questions about this research study now or at any time during the study, by talking to the researcher, Kathleen Wilson, Beaverton School District, working with you and your child or by calling Dr. Patricia Hershfeldt, Faculty Associate, Johns Hopkins University (443) 248-4049. If you or your child have questions about your child's rights as a research participant or feel that your child has not been treated fairly, please call the Homewood Institutional Review Board at Johns Hopkins University at (410) 516-6580.

IF YOU ARE HARMED BY PARTICIPATING IN THE STUDY:

If you feel that your child has been harmed in any way by participating in this study, please call Dr. Patricia Hershfeldt, Faculty Associate, Johns Hopkins School of Education (443)

248-4049. Please also notify the Homewood Institutional Review Board at Johns Hopkins University at (410) 516-6580. This study does not have any program for compensating or treating your child for harm he or she may suffer as a result of his or her participation.

SIGNATURES

WHAT YOUR SIGNATURE MEANS:

Your signature below means that you understand the information in this consent form. Your signature also means that you agree to allow your child to participate in the study. Your child's signature indicates that he or she agrees to participate in the study.

By signing this consent form, you and your child have not waived any legal rights your child otherwise would have as a participant in a research study.

SIGNATURES:

_____

Child's Name

_____

Child's Signature (if applicable) **Date**

_____

Signature of Parent **Date**

_____

Signature of Second Parent (if required) **Date**

_____

Signature of Legal Guardian (if applicable) **Date**

_____

Signature of Person Obtaining Consent **Date**
(Investigator or HIRB-Approved Designee)

_____

Witness to Consent Procedures (if required by HIRB) **Date**

Peer Trainer Consent Form

PART II. CHILD ASSENT FORM

A research study is a way to learn more about something or how things work, and we are doing a research study at your school. We would like to find out more about how fourth and fifth grade students and their friends help each other play with others and how they become buddies. You are being asked to join the study because you are a fourth or fifth grader who was recommended by your teachers as a good friend to others. You have also expressed an interest in being a Peer Buddy.

If you agree to join this study, you will be asked to participate in the following:

- Meet 4 times after school before the study begins for a "training" with other peer buddies that will include a pizza and ice cream break.
- During each meeting, you will learn about play skills, and how to help other students learn to use those skills as they play with others. You will watch videos of other kids playing and then you will get to make your own videos showing how to help others play.
- You will receive a Leadership Award for participating in this training.
- After school starts, you will be asked to help and teach a buddy who is learning how to make friends and asking others to play. We will ask you to help that buddy during twenty recesses over this next school year. Twenty recesses sounds like a big number but you will only be playing with this special group two times a week out of a total of ten recesses each week. That means that there will be eight recesses a week when you go to recess and play with anyone you like, and only two recesses a week when you will play with your "play buddies". These weeks during which you will be helping your buddy will happen ten times out of the school year's forty weeks of attendance.

We expect that, during the study, helping a peer buddy will build even stronger leadership skills in you and increase the responsibility you already demonstrate. Helping another student will provide you the chance to make a positive impact on someone's life. We also think that you will have fun making friends with new people. Through your help on this study, we may learn something that we can share with other children to help them make friends with others.

There is no risk or harm to you to be in this study since you will be playing at recess at your school at the same time as your classmates. But we want you to know that you do not have to join this study. It is up to you. You can say okay now and change your mind later. All you have to do is tell us you want to stop. No one will be mad at you if you don't want to be in the study or if you join the study and change your mind later and stop.

Before you say **yes or no** to being in this study, we will answer any questions you have. If you join the study, you can ask questions at any time. Just tell the researcher that you have a question.

If you **want to be** in this study, please sign your name. You will get a copy of this form to keep.

SIGNATURES

WHAT YOUR SIGNATURE MEANS:

Your signature below means that you understand the information in this consent form. Your signature also means that you agree to participate in the study. Your parent's signature indicates that he or she agrees to allow you to participate in the study.
By signing this consent form, you have not waived any legal rights you otherwise would have as a participant in a research study.

_____

Child's Name

_____

Child's Signature **Date**

_____

Signature of Parent **Date**

_____

Signature of Legal Guardian (if applicable) **Date**

_____

Signature of Person Obtaining Consent **Date**
(Investigator or HIRB-Approved Designee)

_____

Witness to Consent Procedures (if required by HIRB) **Date**

Recess Duty Staff Consent Form

Johns Hopkins University

Homewood Institutional Review Board (HIRB)

Teacher Permission Form

Title:	Peer-mediated Social Skills Training
Principal Investigator:	Dr. Patricia Hershfeldt, Johns Hopkins University
Date:	December 2, 2016

PURPOSE OF THE RESEARCH STUDY:

The purpose of this research study is to investigate the impact of peer-mediation at recess on the generalization and of learned social skills for elementary students with high-functioning autism. We anticipate that approximately 16 children of both genders will participate in this study across two research sites within your child's school district. Students at your school will be participating in this study to improve social skills. In this research project, participating students will practice social skills that have been modeled for them by peer trainers. To gain an understanding of the students' social interactions and skills with his/her peers, we would like your perspective.

Being in this project may include these activities:

You will be asked to observe and then rate the quality of participating student's skills and behaviors with peers on the playground at recess.

You will be asked to complete the Social Responsiveness Scale-2nd Edition before the intervention (in September, 2016), midway through the study (approximately at the end of October, 2016) and after the study is completed (January, 2017) on each of the four students. Each administration of the online checklist will take you approximately 15 minutes.

Benefits of being in this project include:

You will be providing important information that will help us to improve programs that can assist kids in improving their social skills in the school setting.

There are few risks of being in this project.

You may feel some discomfort in expressing your opinion about participating students. No other risks are anticipated.

Being in this project is voluntary.

Although we believe you can provide helpful information, it is your decision to take part in this project. Your choice about being in the project will not affect your relationship with the school district and will not result in any extra benefit or penalty. If you choose to participate, you may change your mind and leave the project at any time without penalty. If you choose to withdraw from this project, any data already provided will be separately coded to indicate your withdrawal (records must be retained for seven years per IRB policy).

All information we receive will be kept confidential.

All information you provide will be marked with a code number. Only research staff will know which person is assigned which number. Any presentation of the data will not contain identifiable information. The information collected will be stored in a safe place at JHU for seven years before being safely destroyed. The information will not be shared with anyone in your school district.

Questions and Concerns

You may ask questions about this research study now or at any time during the study, by talking to the researcher working in your site, Kathleen L. Wilson, (503)-860-6008, or by calling Dr. Patricia Hershfeldt, Faculty Associate, Johns Hopkins University (443) 248-4049.

Signature of Teacher	**Date**
Signature of Person Obtaining Consent (Investigator or HIRB-Approved Designee)	**Date**

Appendix E

Target Student Skill Data Sheet

DATE: TIME:	**Target Student** **BL INTERV** TS1 TS2 TS3 TS4	**Peer Trainers** P1A P1B P1C P2A P2B P2C P3A P3B P3C P4A P4B P4C

DIRECTIONS: Circle Target Student and Peer Trainers you are observing. Circle BL or INTERV. Each observation is 10 minutes long.

Social Interaction Behaviors: Use a *Frequency Count* to code target students' social interactions using the key (on bottom of page) as reference. Make a tally for each observed behavior in corresponding row.
Social Engagement Behaviors: Use *Momentary Time Sampling* to code target students' social engagement using the key as reference. Each beep indicates a new 15-second interval. When you hear the beep, code the occurrence of the behavior happening at that moment by writing the letter (e.g., a,b,c) in the corresponding box.

TARGET STUDENT SOCIAL INTERACTION BEHAVIORS:

FREQUENCY OF BEHAVIOR		Σ	%
Eye Contact			
Verbally Responds to Peer			
Initiates with Peer			
TOTAL BEHAVIORS			

TARGET STUDENT SOCIAL ENGAGEMENT BEHAVIORS:

DURATION 15-Second Intervals for 10 minutes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Σ
	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	%

KEY:
Eye Contact*: target student looks in the direction of the peer's face*
Verbally Responds to Peer*: (a) making eye contact when name is called; (b) following directions or a request (c) answering a question; (d) making a comment; and (e) nodding one's head.*
Initiates with Peer*: (a) greeting another student; (b) asking a student a question; (c) making a comment to a student; (d) offering to share a playground item; and/or (e) saying a peer's name.*
Social Engagement in Play: *(a) three or more reciprocal exchanges; (b) walking with or sitting together with another student while talking; and (c) engaging in a game or activity with peer(s).*

Appendix F

Definitions of Observed Initiation Strategies By Peer Trainers

BEHAVIOR	OPERATIONAL DEFINITION
Initiation	Peer Trainer begins a new social sequence by providing an appropriate verbal and/or nonverbal behavior (e.g., question, comment, etc,) directed towards a target student. *Examples:* • I like your shirt, I have one just like that • What is your favorite computer game? • What is your favorite food? Do you like to play with Legos?
Response	Peer Trainer appropriately responds verbally and/or nonverbally to social stimuli (i.e., initiations) directed towards him/her by a target student
Invitation	Peer Trainer invites the target student to join in social interaction with one or more others *Examples:* • Let's play Wall Ball • Let's ask those guys if they want to play with us
Modeling	Peer trainer engages and models for the target student. *Examples:* •That girl looks lonely; let's ask her to play with us • Let's play a game where you and I take turns saying something and responding three times

Note. Operational definitions based on suggestions by Strain (1987)

Appendix G

Fidelity of Instruction of Peer Trainers

Coder Name:	Session #:	Date:	Initials of Absent Peer Trainers:

Directions: Observe the delivery of each component of the program. Circle 1 = if the behavior occurred or 0 = if the behavior did not occur.

Training Component	*Rating*	
Introduced the purpose of the day's training	0	1
Introduced the social competence area and the challenges in this area experienced by students with HFA	0	1
Introduced steps to follow in training a peer student in this social skill	0	1
Introduced strategies: (circle strategies introduced) 1 2 3 4	0	1
Handed out cue cards to the Peer Trainers	0	1
Modeled social skill _____ and strategy 1_____	0	1
Modeled social skill _____ and strategy 2_____	0	1
Modeled social skill _____ and strategy 3_____	0	1
Modeled social skill _____ and strategy 4_____	0	1
Allowed an opportunity for students to role play with each other and practice social skill strategies while being videotaped	0	1
Led feedback session on videotape role play (pros and cons) and allowed second opportunity to rehearse and role play based on feedback session	0	1
Allowed an opportunity for students to ask questions	0	1

Appendix H

Fidelity Worksheet of Peer Trainers' Interactions with Target Students

DATE:	Target Student/Peer Group Observed:	TIME:

Directions: Each observation is 10-minutes long.

Peer Trainer Fidelity: Use an ***Interval Count of 2 minutes*** (5 intervals) once a week for each target student's peer group. Make a tally for the occurrence of each behavior in the corresponding rows when the timer buzzes.

FREQUENCY *5- two Min Intervals*	**PEER 1** 1 2 3 4 5	**PEER 2** 1 2 3 4 5	**PEER 3** 1 2 3 4 5	**SUM**	**%**
Initiation					
Response					
Invitation					
Modeling					
TOTAL per PEER					

RATER: _____

Appendix I

Student Interest Survey

***** STUDENT INTEREST SURVEY*****

1. My best friend(s) is (are) _____
2. In my spare time, I _____
3. I get embarrassed the most when _____
4. My favorite game or sport (to play) is _____
5. My favorite kind of music (or group) is _____
6. My favorite subject in school is _____
7. The accomplishment that I am most proud of is _____
8. My favorite movie is _____
9. The hobby I enjoy most is _____
10. If I could have anything in the world, it would be_____
11. My favorite teacher is _____
12. I really get angry when _____
13. I would like my future career to be _____
14. My choice for a vacation place would be _____
15. The book I liked most was_____
16. My favorite family occasion is _____
17. My favorite food is_____
18. My choice for a vacation place would be _____
19. I think I am good at_____
20. My most prized possession is _____

- The New Teacher's Complete Sourcebook © Paul Naegle, Published by Scholastic Teaching Resource

Appendix J

Student Questionnaire About Feelings

On this questionnaire, you may select the answer that best fits you. You can only mark one answer. Remember that there are no right or wrong answers.

Please read the statement on each line below, and then mark if it is ***Not True, True Sometimes, Usually True,*** *or* ***Always True:***	***Always True***	***Usually True***	***True Some of the Time***	***Not True***
1. I feel sorry for other kids who don't have toys and clothes.				
2. When I am angry or upset with someone, I usually try to imagine what he or she is thinking or feeling.				
3. It makes me sad to see a child who can't find anyone to play with at recess.				
4. I can tell just by looking at a person, whether they are happy.				
5. Seeing a child who is crying makes me feel sad.				
6. I really like to watch people open presents, even when I don't get a present myself.				
7. When I see children being picked on, I feel sorry for them.				
8. When arguing with my friends, I think carefully about what they are saying before I decide whose idea is best.				
9. I can tell what mood my parents are in by the look on their faces.				
10. I feel sorry for people who don't have the things that I have.				
11. I notice right away when something makes my best friends unhappy.				
12. I can often guess the ending of other people's sentences because I know what they are about to say.				

CONTINUED: Please continue to read the statement on each line below, and then mark if it is ***Not True, True Sometimes, Usually True,*** *or* ***Always True:***	***Always True***	***Usually True***	***True Some of the Time***	***Not True***
13. When I see another child who is hurt or upset, I feel sorry for them.				
14. When I walk by a needy person I feel like giving them something.				
15. I feel sorry for other children who are being teased or picked on.				
16. On the phone I can tell if the other person is happy or sad by the tone of their voice.				
17. It upsets me when another child is being shouted at.				
18. I often know the ending of movies or books before they have finished.				
19. I often try to understand my friends better by seeing things from their point of view.				
20. I think people can have different ideas about the same thing.				

4, 5, 7, 11, 13 ,17 adapted from the Empathy Questionnaire for Children and Adolescents: EmQue- © Carolien Rieffe, Developmental Psychology, Leiden University, the Netherlands

Appendix K

Follow-up on Effectiveness of Student Interest Survey

Peer Trainer Name:_____

I would like you to share how well you feel matching your Student Interest Survey responses with those of your Student Buddy helped you be a social model for him/her. Please read each statement below and mark whether it was Always True, Sometimes True, or Never True:	**Always True**	**Sometimes True**	**Never True**
1. Being matched with a student buddy who likes some of the same subjects in school helped me get conversation started.			
2. Talking about favorite vacation places that both my student buddy and I had in common (because we have been there or want to go there) made it easier for us to keep a conversation going.			
3. Talking about the games we like on the iPad helped us get to know each other.			
4. Sharing our favorite teachers was a way to talk about common interests with my student buddy.			
5. Talking about common activity interests (like Boy Scouts, Girl Scouts, sports) gave me conversation starters to use to model initiation with my student buddy.			
6. When we shared books or movies we liked, it seemed to make it easier for my student buddy to talk with me.			
7. Playing games together at recess helped me get to know my student buddy in a different way than I know the buddy in classes.			

Fill in the blank in the two statements below:

I felt good as a peer buddy when my student buddy_____

_____.

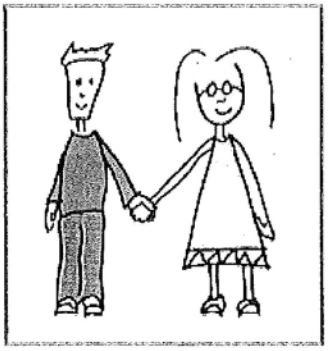
I think that I helped my student buddy in the following ways: _____

_____.

Appendix L

Materials Utilized During Peer Training

Kids Helping Kids



Teaching Typical Children to Enhance the Play and Social Skills of their Friends with Autism and Other PDDs: A Manual

by Karen Pierce, Ph.D. & Laura Schreibman, Ph.D.

Illustrations by Chris Robertson

Peer Training Strategies

1. Paying Attention:
- Before I ask my friend a question, or ask him or her to do something, I must be sure that he/she is paying attention. He or she should be looking at me or the toy.
- Not paying attention: Not looking at me, screaming, flapping arms.

1. Simple Instructions:
- When I ask my friend to do something, my instructions must be easy to understand. "Billy, put your foot on the pedal." "Susie, find the picture that looks like this."
- Not like this: "OK, hang on tight so you won't fall off, and swing your leg up here." "There sure are a lot of pictures here, aren't there? Where's the one that's similar to this one?"

2. Child's Choice:
- To help my friend learn, I should let him/her choose what to play with. We can still take turns.
- Not giving a choice: If I make him or her play with things only I like, he or she may not want to play at all.

3. Showing How to Play:
- If my friend does not understand how to play with a toy or game, I can show him or her. "Look! This is how we play."

4. Encouraging Conversation:
- If my friend seems interested in a game or toy, encourage him to ask for it before giving it to him or starting to play the game. If your friend is looking at the blocks, pick up a block and ask, "What do you want?"

5. Taking Turns:
- When I am playing with my friend, we need to take turns. This helps my friend learn about sharing. It also gives me a chance to show him or her new ways to play with the toy.

6. Reinforcing Good Tries:
- Even if my friend is not exactly right, I should reward him or her for a good try.

---

7. Model Social Statements:
- "I like this game." "I am having fun." "You are nice."

8. Exaggerate Positive Affect:
- "Wow!" "You did a great job!" "Excellent!"

9. Extend Conversation:
- Talk about the things you are playing with or related things. For example, if you are drawing a sun, you might say: "I like to play outside in the sun. Do you like to play

in the sun?" or "I like to draw with this blue crayon. Do you like to use the blue or red crayon?"

10. Narrate Your Play:

- Explain to your friend what you are doing with the toys. For example, if you are playing with blocks, you might say, "I'm going to put the little block on the big block."

11. Talk About Object Properties:

- In order to help your friend learn about his or her world. Talk about the multiple properties of the toys you are playing with. "Do you want the big, blue block or the small, green block?" "I'm going to put the white pan in the plastic oven." "Do you want to play with the soft, green ball or the hard, blue ball?"

Strategies for Peer Interaction

Keep it simple.

- Teach your peer buddies to "Stay-Play-Talk".
    i. **Stay** in the same area as your friend. Watch what your friend does.

    ii. Make suggestions for what to **Play**. Go along with what your friend likes to play.

    iii. **Talk** about what you and your friend are doing. (Describe it. Example: " We are having fun playing wall ball together, don't you think?") Make positive comments to your peer such as, "I liked the way you looked me in the eye when you asked that question!"

    iv. Talk about your common interests (Example" "I like to read. Do you?").

IMPORTANT STEPS IN BEING A BUDDY

1) Go up to your buddy

2) Gain your buddy's attention (EYE CONTACT) and GREET your buddy

3) Use a strategy of initiation (SPT)

4) Respond to your buddy when he/she says something

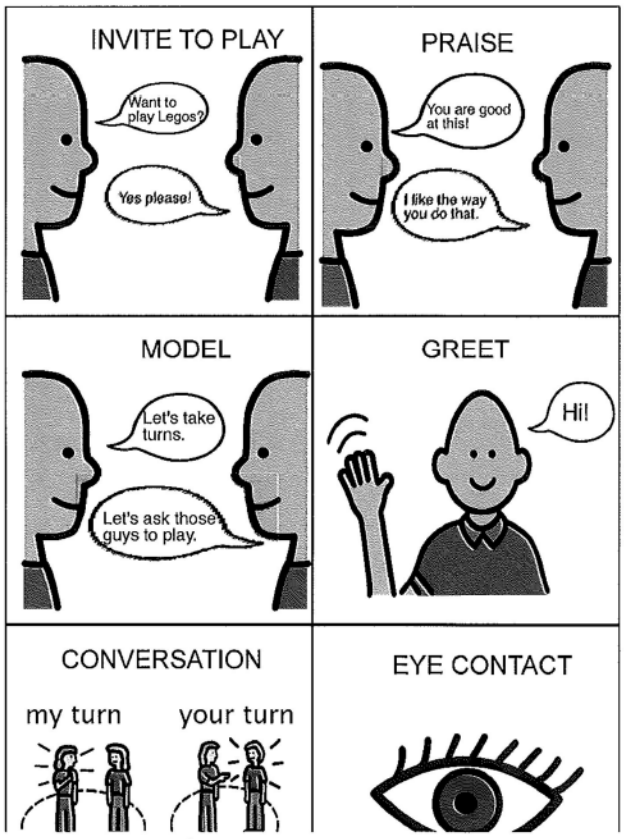
5) Invite your buddy to play a game or join in asking others to play

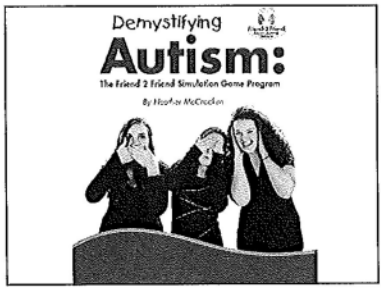
6) model good social interactions ("Let's take turns"; "Let's ask that boy to play with us!")

7) Ignore unwanted behavior but reinforce appropriate behavior (FIND SOMETHING + to say)

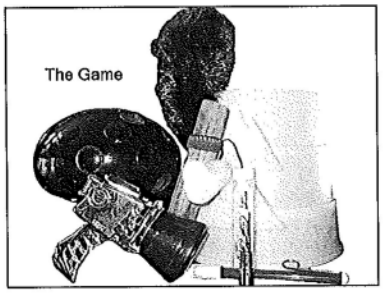
Remember your common interests!

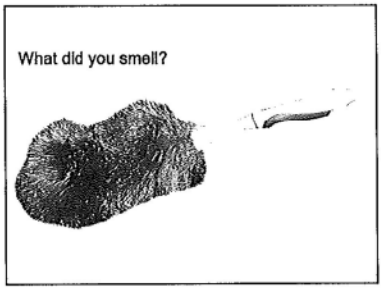
Cue Cards for Prompting Target Students

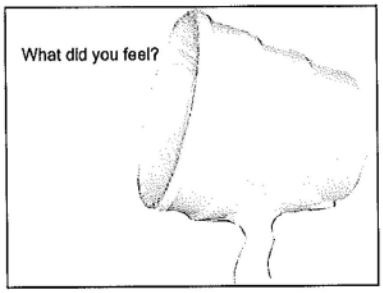


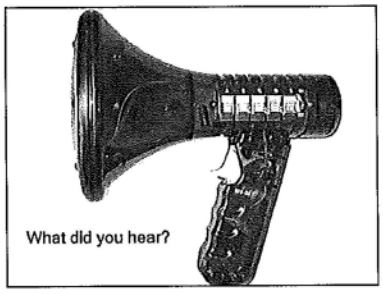


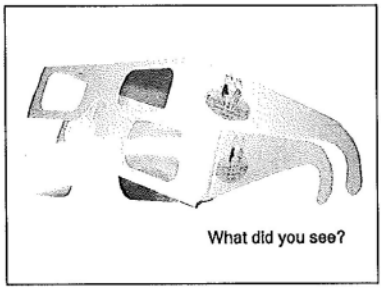
Introduction

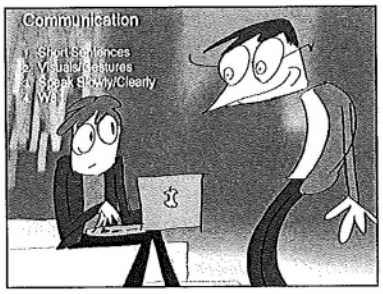


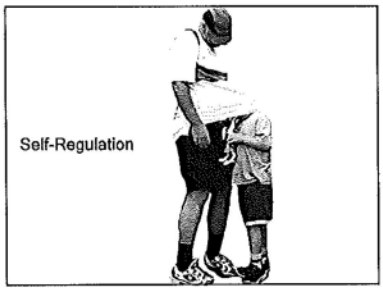


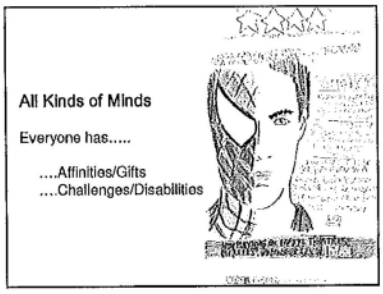


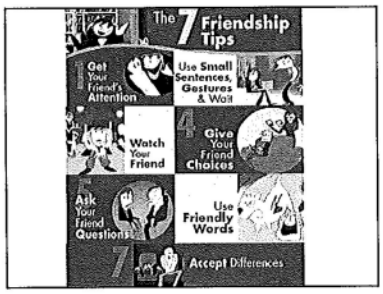


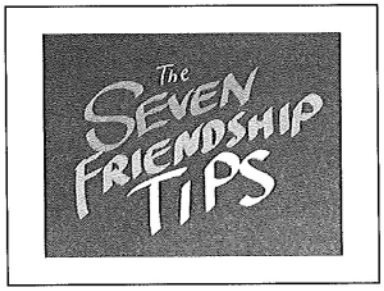


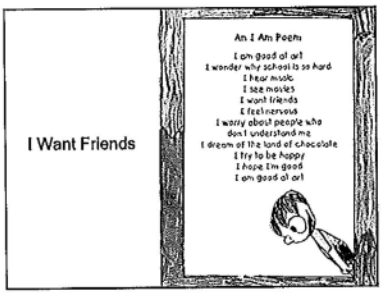


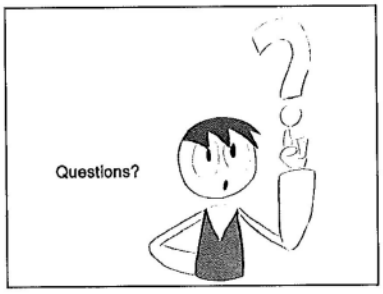


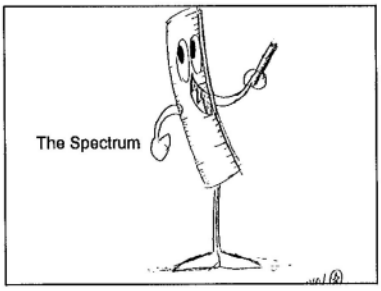












Thank you for participating!

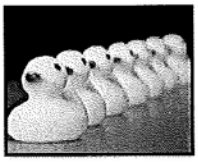

The 7 Friendship Tips
Illustrated by Iain Robbins (IKR)
1 Get Your Friend's Attention
Use Small Sentences, Gestures & Wait
Watch Your Friend
4 Give Your Friend Choices
Ask Your Friend Questions
Use Friendly Words
7 Accept Differences
Copyright © 2009 Friend 2 Friend Social Learning Society
All rights reserved.

Understanding Differences

We are all alike!

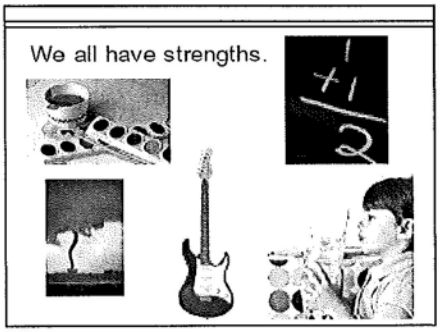
We all have:

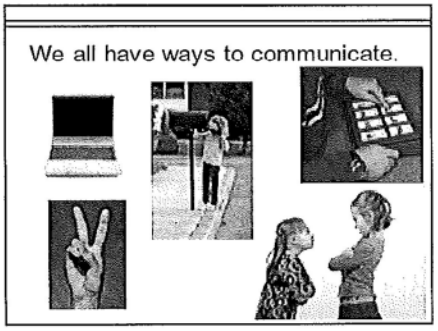
- A body
- Things we like
- Things we are good at
- Ways of communicating
- Feelings

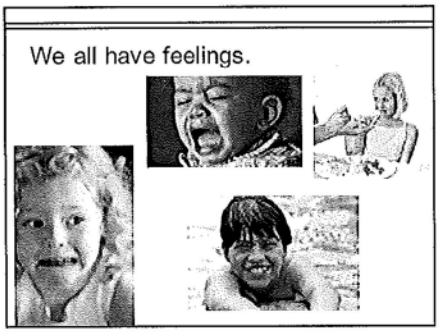


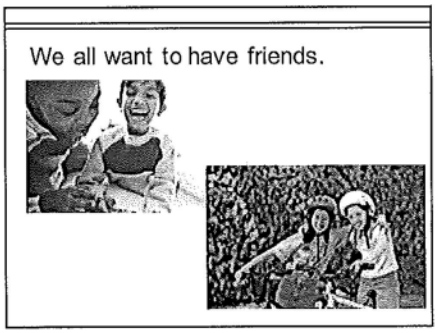
We all have a body.

We all have preferences.


We all have strengths.


We all have ways to communicate.

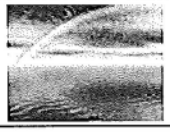

We all have feelings.


We all want to have friends.

2

We are all different, but the same!

- We are alike in more ways than we are different.
- Think about how boring it would be if everyone were the same!



Some kids have difficulty communicating and making friends.

- Messages sent between the brain and body get confused
- Things that are hard:
  - Communicating
  - Making friends
  - Understanding changes

Communication differences:

- Difficulty talking
- Repeat things
- May not understand what we say
- Use actions to communicate
  - May cry or throw a toy when frustrated
  - May flap hands or jump when happy

Challenges with making friends:

- Don't understand facial expressions and emotions
- Difficulty making eye contact
- Play with toys in unusual ways
- Don't understand school rules or friendship rules

3

Challenges with changes:

- Feel confused when schedule or environment changes
- May cry, run away, or try to keep things the same
- May do or say the same things over and over to calm down

Friendship tips for buddies:

- Accept your friend's differences.
- Notice what your friend is good at.
- Move close and get your friend's attention.
- Use simple words and gestures.
- Give your friend choices of things he or she likes to do.
- Join your friend in activities that he or she likes.
- Invite your friend to play. Show your friend what to do by modeling it.

What could you do...

- If you saw a friend playing alone at recess?
- If a friend was talking loudly during story time?
- If a friend grabbed a toy that you were playing with?

Questions?

Appendix M

Implementation Timeline: Peer-Mediated Social Skills Training 2016-2017

PROGRAM IMPLEMENTATION INDICATORS	PLAN TO IMPLEMENT	STAFF	DEADLINE FOR COMPLETION	MONITORING TOOLS
Recruitment Strategies	Peer Trainers: Nominated by school principal, counselor, and teacher using Rubric	Lead (Student) Researcher and principal, counselor, and fourth and fifth grade teachers at each of the two schools	December, 2016	Peer Trainers: Nomination Rubrics
	Target Students: Selected by SLP and District Autism Consultant at each site based on inclusionary criteria	Lead Researcher, SLPs, and Autism Consultant at each school	December, 2016	Target Students: File Review for ASD eligibility and meeting inclusion criteria
	Coders: Potential observer/coders to be interviewed	Selected by Lead Researcher	December, 2016	Lead Researcher
Consent Forms **-Parents** **-Peer Trainers** **-Recess Duty Staff**	Signed and Returned	Lead Researcher	By January 2, 2017	Excel Flow Chart of Consent Forms
Observer/Coders Instruction	Criteria: Inter-observer agreement level of 80% or higher for two consecutive trainings and four practices at recess	Lead Researcher and three District Autism Consultants	January, 2017	Practice by coding videos of typically developing students at recess and on-site practice along with Lead Researcher and Observer One

Peer-Trainer Instruction	Four 1.5 hour of trainings including: explicit instruction of strategies, rehearsal and practice, role play, and video modeling	Lead Researcher	January, 2017	Observation, direct instruction, video-modeling, role-play
Fidelity Monitoring of Instruction of Peer Trainers	Observers code the instructors of the peer trainers to ensure that they follow the Peer social skills training curriculum in explicit instruction	Two District Autism Consultants	January, 2017	Utilizing fidelity checklist in Appendix E, total number of items with a score of 1 will be divided by the total item number of 12 for percentage
Completion of Social Skills Observation Checklists	Completed by two Recess Duty Teachers and by Parents of Target Students before, midway through, and after the intervention	Lead Researcher	Pre: January, 2017 Mid: Midway through Intervention Phase Post: After the generalization probe phase	Checklist completed by respondent and computer-scored and stored in Results Excel Chart
Completion of Student Interest Survey	Completed by target students and peer trainers before intervention.	Lead Researcher	December, 2016	Checklist scored and stored in Results Excel Chart to match peer trainers with target students by similar interests

Baseline Observations	Coders observe target students at recess two times a week for two/three weeks	Lead Researcher to coordinate coders	Begin: First students begin first week of January, 2017 (then following groups are staggered)	Coders utilize Target Skill Worksheet to tally observations
Data Collection Techniques	Collect data on independent social initiations/responses	Lead Researcher coordinates data-taking and collects data sheets	Ongoing throughout baseline per each student	Data added to data on Multiple Baseline Graphs
Intervention	Peer trainers facilitate social interaction of target students during two recesses a week for ten weeks	Lead Researcher prompts and coaches peer trainers as they facilitate the social skills training	Begin: As soon as stable baseline is observed (utilizing the staggered multiple baseline design)	Lead Researcher on-site to prompt peer trainers if needed
Data Collection Techniques	Coders observe target students at recess two times a week for ten weeks	Lead Researcher coordinates coders	Ongoing	Lead Researcher collects data sheets daily to add to data on Multiple Baseline Graphs
Implementation Fidelity of Peer Trainers	Observer One and Observer Two take fidelity of implementation on peer trainers once a week during the intervention phase	Lead Researcher collects FOI sheets for each pair of coders for the intervention phase	Ongoing throughout 10 weeks of intervention phase as staggered across Target Students	Fidelity of Implementation measures used to monitor peer trainers in utilizing explicit strategies. Data analyzed for FOI % scor

Inter-Observer Agreement of Coders	Data recorded on the Target Worksheet by Observer One and second observer are analyzed for half of intervention sessions	Lead Researcher collects and analyzes data	January-April, 2017	Lead Researcher stores data on Results sheet on Excel Chart. Data on each Target Student to be utilized to calculate IOA
Generalization Phase	Coders observe target students two times a week for two weeks at lunch without peer trainers	Lead Researcher	Starting one month after last intervention session	Lead Researcher stores data on Results sheet on Excel Chart
Data Collection Techniques	Checklists for specific behaviors on each target student (from Target Skills Worksheet)	Lead Researcher	Lead Researcher collects data sheets	Lead Researcher adds data to Multiple Baseline Graphs

Appendix N

Compatibility Matches Resulting from Responses to Student Interest Survey

Overlap of Interests Utilized to Match Target Student 1 with Three Peer Trainers in School 1

TS/P	Play & Leisure	Outdoor Sports & Games	School Subjects	Intense Interests	Enjoyable Family Activities	Favorite Food
TS1	READ CRAFTS	SWIM/ SLED/SKI SKATE	ART/ MATH	ANIMALS	TRAVEL	PASTA
P1A	read	swim gymnastics	art	animal rescue	go to the beach	spaghetti bacon
P1B	draw, read	softball	writing	dogs	going to Italy	Italian Pasta
P1C	music	swimming	read art	animals	traveling	bacon

Overlap of Interests Utilized to Match Target Student 2 with Three Peer Trainers in School 2

TS/P	Play & Leisure	Outdoor Sports & Games	School Subjects	Intense Interests	Enjoyable Family Activities	Favorite Food
TS2	X-BOX, BIKES, PIANO	SOCCER WALL-BALL	MATH/ SOCIAL STUDIES	VIDEO GAMES, X-BOX	GOING OUT TO DINNER	SPAGHETI CARBON-ARA
P2A	read, video games	soccer basketball	math	listen to music, Minecraft	birthdays of family	tacos
P2B	X-Box ride my bike	wall-ball soccer	writing, social studies	Minecraft	going on road trips	Orange Chicken
P2C	listen to music	wall-ball	math	You tube video games	traveling	burgers, spaghetti

Overlap of Interests Utilized to Match Target Student 3 with Three Peer Trainers in School 1

TS/P	Play & Leisure	Outdoor Sports& Games	School Subjects	Intense Interests	Enjoyable Family Activities	Favorite Food
TS3	DRIBBLE BALL	BOY SCOUTS	MATH/ SOCIAL STUDIES	X-BOX: ZOMBIES, MINECRAFT	TRAVEL	CHEESE BURGER FRIES
P3A	iPad games	Boy Scouts basketball soccer	math, read	collects maps	holidays	pizza fries
P3B	video games, sports	soccer, golf basketball	math, reading	video games, X-Box	celebrate birthdays	pizza
P3C	hiking, camping videos	Girl Scouts, soccer basketball	math, social studies	athletics	birthday parties with my twin	pizza fries

Overlap of Interests Utilized to Match Target Student 4 with Tree Peer Trainers in School 2

TS/P	Play & Leisure	Outdoor Sports & Games	School Subjects	Intense Interests	Enjoyable Family Activities	Favorite Food
TS4	iPad GAMES	SWING CHASE	READING	ANIMATED MOVIES, WRITING	HOLIDAYS	SPAGHETI ICE CREAM
P4A	iPad, my new puppy	Chase basketball	reading	listen to music, movies	birthdays of family	tacos
P4B	games with family	softball swing	writing, reading	movies iPad	holidays	Orange Chicken
P4C	hiking, camp	Soccer Girl Scouts	math reading	movies sports	parties birthdays	burgers, spaghetti

Appendix O

Curriculum Vitae

KATHLEEN WILSON
kiki.w@comcast.net

EDUCATION

Johns Hopkins University	Doctor of Education Anticipated Completion July 2017
Lewis and Clark College	Master of Science in School Psychology (APA and NASP approved)
University of Alabama	Master of Arts in Education Bachelor of Science: Psychology Major/Biology Minor

ACADEMIC HONORS

Oregon School Psychology Outstanding Student of the Year
Kappa Delta Pi Honorary Society of Education

TRAININGS

University of Washington	Applied Behavior Analysis Coursework
Vanderbilt University	Treatment and Research Institute (TRIAD) ASD Assessment Trainings
University of North Carolina Chapel Hill	Coursework Completed for TEACCH Certification: TEACCH® Fundamentals of Structured Teaching: TEACCH Classroom Set Up Model

WORK EXPERIENCE

8/2009 – present: Autism Consultant, Beaverton School District, Beaverton, OR:

- consult with teachers in inclusive and self-contained settings
- provide students with social, self-regulation, and management supports
- collaborate with other special education specialists in implementing individual education plans (IEPs)
- conduct clinical ASD evaluations (certified in administration of the ADOS-2 and the ADI-R)
-

10/1998 – 6/2009: School Psychologist, Beaverton School District:

- administered cognitive, social/emotional/behavioral, adaptive, and academic assessments to students from k-12
- designed interventions and devised functional behavior analyses
- provided direct counseling services in the areas of behavior, emotional regulation, anger management, conflict management, and social skills
- consulted with and served as liaison between staff, administrators, and parents
- collaborated with special education staff, teacher assistance teams, families, educational service districts, and medical professional in identifying educational impacts and designing programs for children at-risk for difficulties in the school setting.

RESEARCH EXPERIENCE

8/1995 – 6/1997: Research Associate, Child Psychiatry Department, Oregon Health Sciences University, Portland, OR:

Participated as a researcher in the Adolescent Depression Study, interviewing recently immigrated Cambodian teens in a project funded by the National Institute of Mental Health (NIMH) to investigate the severity of PTSD and depression among students who fled the Pol Pot regime during childhood. Responsibilities included administering clinical interviews to study participants, recording a social history on each subject, and utilizing the DSM-IV to differentiate symptoms of affective disorders, conduct disorder, and symptoms of pervasive developmental disorders.

Professional Memberships
National Association of School Psychologists
Oregon School Psychology Association
National Autism Association